1962

Curricula in agricultural education at the land-grant colleges and state universities in the United States

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CURRICULA IN AGRICULTURAL EDUCATION AT THE LAND-GRANT COLLEGES AND STATE UNIVERSITIES IN THE UNITED STATES

by

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A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Vocational Education

Approved:

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1962

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INTRODUCTION

Far-reaching changes and advancements have been made in agriculture in the United States during recent years. The farmer has given up the shovel and pitchfork, the hoe and rake, the team and wagon, and instead he now has the labor saving machines -- the tractor, the truck, the electric motor, the hydraulic lift and power loader. We have moved from an era of man production to an era of machine production. There is a higher standard of living on the farms. The farm work has been greatly lightened and more easily performed. Farming has become a business which involves scientific knowledge and practices. It has become highly specialized, organized and mechanized, and has become the nation's leading industry in the use of capital. Farming has become a complex business. Production, management and marketing problems more complex than formerly must be solved. It was believed in the past that anybody could farm. Such an opinion is not appropriate today. The farmer of today and of tomorrow must cope with numerous and complex problems. He must arrive at correct conclusions based upon sound judgment and careful evaluation.

The developments in farm technology have created an urgent and increased need for training of farm youth and farmers in farm science and technology, farm equipment and maintenance, and in farm management. Phipps (16) indicated that it has been estimated that approximately 150,000 new farm

operators will be needed annually in the United States to replace those who discontinue the occupation, and that there is a need for more new farm operators than the number of high school pupils now enrolled in vocational agriculture.

The greater specialization and commercialization in the production of many farm products than formerly reflect rapid technological advances in production practices, sweeping changes in the organization and operation of individual farms, and the specialization of farm production on larger productive units. These changes and advances present far reaching challenges to agricultural education.

The present trends in farming in the United States, as revealed in the 1961 Statistical Abstract of the United States indicated that agriculture today involves more capital, more machines, fewer workers, and high farm expenses than in the past. Therefore, farmers must be more careful and proficient in planning and management of their farming businesses in order to successfully solve the complex farming problems.

There is need for a continuous examination and revision of the curriculum in agricultural education in order to keep up with the changes in agriculture. The curriculum should be designed to meet the ever-increasing needs of teachers of vocational agriculture to be adequately prepared if they are to be able to assume their responsibilities.

Originally the major objectives of agriculture had to do with securing proficiency in farming on the part of those now

engaged in farming and those intending to farm. The major objectives (21, p. 4) of vocational education in agriculture as listed were to develop effective ability to:

1. Make a beginning and advance in farming.
2. Produce farm commodities efficiently.
3. Market farm products advantageously.
4. Conserve soil and other natural resources.
5. Manage a farm business effectively.
6. Maintain a favorable environment.
7. Participate in rural leadership activities.

Some teacher trainers and state supervisors would like to see the objectives be as follows:

1. Make a beginning and advance in farming or in an agricultural occupation which requires competence in farming.
2. Apply the principles of science, management, economics and mechanics to the efficient production and marketing of farm products.
3. Make decisions concerning the choice of an agricultural career.
4. Plan and prepare for post high school education in agriculture.
5. Maintain a favorable home environment.
6. Appreciate the importance of agriculture of our national welfare.
7. Manage and use wisely soil, water and other natural resources.

8. Participate effectively in school and community affairs.

The teacher of vocational agriculture must possess or develop the abilities required to perform the many duties involved in conducting a successful program of vocational agriculture. Some of these abilities (16, p. 46) are:

1. Ability to establish and maintain relationships.
2. Ability to determine community and individual needs.
3. Ability to develop and improve the local program of agricultural education.
4. Ability to organize and use advisory groups.
5. Ability to plan and maintain instructional facilities.
6. Ability to advise the local Future Farmers of America Chapter, young farmers association, and other school sponsored organizations.
7. Ability to develop and supervise farming programs of all groups which receive instruction.
8. Ability to plan instruction and teach all-day pupils, young farmers, and older adult farmers.
9. Ability to provide guidance, placement, and follow-up.
10. Ability to keep departmental records and make reports.
11. Ability to administer, supervise, and coordinate the activities of the local department.
12. Ability to relate agricultural education to the highest values.
13. Ability to behave as a professional educator and as a member of a professional group.

A need has arisen for additional training programs in agriculture. This is caused by the development of many new and specialized occupations due to the changes that have taken place in farming since the Smith-Hughes Act was passed in 1917.

The program of vocational agriculture, in addition to

training high school students, young and adult farmers, for farming and technical production, must serve the general education needs relating to agriculture and provide training for off-farm agricultural occupations. The farm related occupational groups need intensive and basic technical training in agriculture plus work experience. The groups that need to be served by the program are employed or preparing for employment as workers in greenhouses, nursery and turf businesses, forestry, horticulture, regulatory agencies and agricultural societies. Some are off-farm investors in farming, are employed in processing and marketing of farm products, or are migrant and part time farm workers.

The kinds of training needed by various groups should include an overview of agricultural occupations, systematic class instruction, basic farm experience, and practical experience in off-farm agricultural occupations. Due to the nature and diversity of the training needed in the field of specialty, especially for farm related agricultural occupations, various types of teachers with training in specialty fields may be needed. A multiple teacher department may necessitate the preparation of teachers who have specialized in the academic, technical, or practical phases of agriculture.

Consequently, the programs for preparing teachers of vocational agriculture must be adjusted to meet the changing

picture of agriculture. Teacher educators must identify the weaknesses and practices in the present curricula for teacher preparation and plan constructively programs that will prepare teachers to more adequately meet their responsibilities in meeting the educational needs of present and prospective workers in farming and in agricultural related non-farm occupations.

Teaching is a very responsible profession and one that is vital to the welfare of the nation. Consequently, prospective teachers should be selected on the basis of capability and interest. Selection of candidates is an important phase of the program and places much responsibility on those responsible for the program.

Good teaching does not come from a thorough knowledge of subject matter alone. It is believed that good teaching is an art which has to be studied, practiced and developed. Good teachers provide for independent thinking, creativity, and adaptability and make adjustments for individual differences in competence and experience.

Properly prepared vocational agriculture teachers can develop the understandings of scientific agriculture and applied abilities needed by present and prospective farmers and by persons employed in off-farm occupations in agriculture.

In analyzing the developments in today's scientific

agriculture, it is firmly believed that the most important factor has been education. The colleges of agriculture have trained farmers and farm leaders. Agricultural education departments have trained professional teachers of vocational education in agriculture who in turn have provided training for farm operators. While the present program of agricultural education has been effective, its effectiveness can be improved. Improvements in the quality of the pre-service and in-service programs of teacher education for vocational agriculture instructors will result in greater effectiveness on their part in helping farmers and workers in agricultural occupations cope with the problems encountered in an increasingly complex agricultural economy.

Continuous examination of the curriculum in agricultural education is necessary to determine if it meets quantitatively and qualitatively the needs of vocational agriculture teachers. Teacher trainers should continuously adjust the program of pre-service training in agricultural education in the light of the needs of the trainees in coping with the problems associated with technological developments and advances in agriculture.

If the pre-service curriculum in agricultural education is to be most effective, it should be developed in accordance with the basic principles, purposes, and philosophy of agricultural education.

REVIEW OF RELATED LITERATURE

A review of literature revealed that 39 studies related to teacher education programs in agriculture had been made during the 10 year period, 1950-1960. Of these studies, only two were conducted on a national level. One study was conducted by Loreen (10) in 1953. The second study was made in 1959-1960 by the United States Office of Education (21). Two other studies were conducted on a regional level. One of these studies was conducted in 1953 by Scarborough (18) and the other study in 1954 by Luster (11). The remaining studies were all conducted on a state level.

Only one regional and no national study had been made in regard to pre-service curricular standards for preparing teachers of vocational agriculture during the last decade.

Need for Adequate Agricultural Education in Preparing Teachers

Byram (3, pp. 12-13) summarized the impact of technology on agriculture in the statements below:

> ... Farming has, indeed, become a complex business that presents a tremendous challenge to the initiative, resourcefulness, and thinking ability of youth who enter it. Ability to make managerial decisions, to project plans into the future, to operate and maintain complex equipment, and to apply known scientific and mechanical knowledge to farming operations all combine to require high native ability, coupled with specialized training of a high order.
>
> The breadth and depth of knowledge of science necessary in farming and other agricultural occu-

> pations have been steadily growing. The development and use of antibiotics, tranquilizers, new sprays and dusts, chemical weed control, hybrid varieties, cross-breeding, artificial insemination, and application of electronics to operations are only a few of the modern advancements that must be understood today ....
>
> Only one who is well acquainted with the technological developments in agriculture can adequately help youth to picture the future realistically in this field of occupations. It may well be that there is no field of agriculture.

In 1961 Nielsen (14), in his discussion of the need for vocational education in agriculture concluded that there is a vast and urgent need which now exists for an intensified, optimum program of vocational education so that the nation's farmers can be assisted. Vocational education in agriculture during this decade must be challenging, dynamic and must be commensurate with the rapidly shifting nature of the nation's agricultural economy so that it can successfully meet the need.

Caldwell (4, pp. 3-6), commented on the importance of adequately prepared teachers. He stated:

> If vocational education in agriculture is to keep pace with the present-day demands of education it would be reasonable to assume that the leaders in teacher education should establish a program that will meet demands. With the farming enterprises becoming increasingly specialized there is a need for adequately prepared teachers of vocational agriculture.
>
> The teachers themselves realize that there are some weaknesses in the pre-service program and would like to see a study of this nature.

> Programs of curricular study and revision, either institutional or cooperative, should be undertaken much more vigorously in the land-grant institutions so that knowledge of the best curricular offerings and practices so far attained may be more readily disseminated among the teacher-training staff.

In a similar study, Luster (11, p. 29), explained his concept of the knowledge needed by the teacher of vocational agriculture by stating that:

> ... The agriculture teacher has a wide range of knowledge of subject matter that may be taught in class, perhaps more diversified than any other teacher in high school. Not only does he need to have a broad understanding of agriculture, but he must also be well grounded in many contributing sciences, such as chemistry, botany, zoology, geology, bacteriology, physics, economics, entomology, sociology and mathematics. This, plus the fact that agriculture is at present one of the most rapidly changing sciences, makes the knowledge needed by agriculture teachers extremely extensive.

In the same study, Luster (11), recommended that factors of a qualitative nature are of utmost importance and that they can greatly alter or improve the situation at any institution.

In 1961 Deems (6) concluded that individuals in the agricultural education profession must conduct intense self-examination studies and try new methods of organizing the instructional program, refine these methods and rework them until a plan that will meet the needs of 1962 agriculture can be found. He also commented that due to rapid learning on the part of the individual and increasingly complicated problems in today's farming, many of the old ways of conducting programs are not now the best ways.

James (9), in a speech delivered at the Agricultural Education Section Meeting of the American Vocational Association convention held in Kansas City in 1961, made the following remarks in regard to the need for changes in agricultural education:

1. There is a need for the inclusion of more emphasis on scientific, sociological, and economic aspects of agriculture as differentiated from the teaching of specific manipulative skills.
2. Greatly increased emphasis is needed in the areas of occupational information, exploration, guidance and counseling.

Farrall (7), in 1961, stated that most of the leading universities have recognized the changes in agriculture and have adopted a basic philosophy of agriculture in the broad sense, rather than in the narrow or productive sense only. He defined the new concept of agriculture in the statement below:

> The new broad concept of agriculture of what is known as agri-business interprets agriculture as being concerned with not only production of food and fiber and its attendant problems, machines, and methods, but also the problems, machines and methods of transportation, processing, storage, handling and distribution to the consumers.
>
> Agriculture, if considered in the broad picture, is approximately a ninety-billion-dollar-per-year business. At the present time we are serving really not much more than the thirty-billion-dollar-per-year business which deals primarily with the production of agricultural crops.

Guiding Principles for Institutions Preparing Teachers in Agricultural Education

Some common objectives in training teachers of vocational agriculture at colleges and universities have been identified and pursued. The establishment of principles for such purposes should contribute to the development of these objectives among teacher training institutions. In 1958, the committee for establishing guiding principles for such programs developed the following list of principles (2, pp. 1-2):

1. Teacher training institutions should be responsible for providing adequate facilities and staffs for training teachers of vocational agriculture.
2. Training institutions should make provisions for recruiting, training, and placing prospective teachers of vocational agriculture.
3. Teacher training institutions should make provisions for in-service training of teachers of vocational agriculture.
4. Teacher training institutions should be responsible for processing and making available teaching aids needed by teachers of vocational agriculture.
5. Teacher training institutions should make provisions for conducting research essential to the program of vocational agriculture.
6. Teacher training institutions should cooperate with local, state, and national groups and individuals concerned with the welfare of education and agriculture.
7. Teacher training institutions should be responsible for continuous appraisal of changes in agriculture and for making curriculum adaptations to meet changing conditions.

General Education

Scarborough (18), in his 1953 survey of the undergraduate programs in agricultural education in the Southern Region, found that a range of 24 to 77 semester credits in general education were required. Of these, a range of 8 to 22 credits were in communications; 0 to 6 credits in mathematics; 3 to 12 credits in social sciences; and 13 to 37 credits in natural sciences.

In 1954, Luster (11), in a study of pre-service curricula in the North Central Region, reported that a range of 56 to 87 quarter credits, or average of 65 quarter credits in general education were required. Of these, a range of 25 to 65 credits, or an average of 38 credits were required in physical and biological sciences, and a range of 15 to 32 credits, or an average of 27 credits, were required in social sciences and humanities.

According to Luster (11) the jurors used in his study recommended more required course work in general education. Their recommendations ranged from 60 to 98 quarter credits instead of 56 to 87 credits required in their institutions. The proposed increase in general education amounted to three more credits of work in the physical and biological sciences and one hour in the social sciences and humanities.

Couch (5, pp. 24-25) indicated that the social studies were evaluated by in-service teachers of vocational agricul-

ture as follows:

> Of 110 teachers reporting in evaluation of the social studies, 15 percent indicated that they are of great value and 5 percent indicated need for more work.

In the same study, Couch (5, pp. 9-10) in evaluating the biological and physical sciences reported that:

> Of 68 teachers reporting in evaluation of the biological and physical sciences, 13 percent indicated that they are of great value and zero percent indicated need for more work.

Phipps (16, p. 45) stressed the importance of good communications for teachers of vocational agriculture. He stated:

> It is especially important for an agricultural teacher to use good English, both in speaking and writing. A community expects all their teachers to be proficient in the use of the English language. A person who misuses the English language is assumed to be an ignoramus by many people no matter how much technical knowledge or skill he possesses.

Graduates in agricultural education at the Ohio State University (24), in a self-rating of the curriculum completed at that institution, recommended that more emphasis be placed on basic "tool subjects" such as written and spoken English.

Matela (12) in a study of the content of curricula in agricultural education in 22 separate land-grant colleges for the whites in the United States indicated that the average relative importance given general education in total curriculum was 32.6 per cent of which 23.6 per cent was in the science area and 9.0 per cent was in the humanities area. The distribution of subject matter in science was 39.9 per cent in

the physical sciences, 36.2 per cent in the biological sciences, 17.0 per cent in social sciences, excluding psychology, and 6.9 per cent in mathematics. The distribution of subject matter in the humanities was 85.2 per cent in English, 6.4 per cent in government, 7.2 per cent in history, and 1.2 per cent in other humanities.

In an evaluation of the curriculum in agricultural education at the Ohio State University (24, p. 24) by undergraduate agricultural education majors, it was reported that:

> Students believed that the courses included in the areas of the natural sciences, and the social sciences and humanities were of lesser value in the preparation for teaching.

The student body recommended a reduction of required credits in natural sciences from 40 to 36 and in social sciences and humanities from 29 to 27 credits.

In an evaluation study of the undergraduate curriculum in agricultural education at the South Carolina State College, Caldwell (4) reported that faculty responses regarding the courses in general education for undergraduates majoring in agricultural education were grouped as "desirable elective" rather than "should be required".

Technical Agriculture

Adequate preparation in technical agriculture is a major factor leading to success in teaching vocational agriculture. Technical agriculture involves an extensive and broad field

of subject matter. For successful teaching the instructor must possess a thorough knowledge and understanding of both theory and practice.

The principles formulated by Luster (11, pp. 55-58), pertaining to the teaching of technical agriculture were summarized as follows:

1. Students should develop attitudes toward agriculture as an occupation and understand its importance and relationship.
2. The pre-service education curriculum should enable students to acquire such attitudes, understandings, appreciations and knowledge of the physical and biological sciences as are essential in analyzing and solving agricultural problems.
3. The curriculum should enable students to acquire such technical knowledge and skill in plant and soil science, animal science, agricultural economics and agricultural mechanics as are necessary to initiate a good program of vocational agriculture.
4. Courses in technical agriculture should enable students to:
   a. Supplement theory in the classroom with practice under actual conditions whenever possible to do so.
   b. Develop practical skills in agriculture as are needed by the typical beginning teacher of vocational agriculture.
   c. Learn under the guidance of capable professors who have mastered the art of good teaching.

In a study made by Matela (12), it was found that technical agriculture courses represented 38.0 per cent of total curriculum requirements in agricultural education. Of the required courses in technical agriculture, 18.6 per cent were in agricultural engineering, 20.7 per cent were in agronomy, 30.8 per cent were in animal husbandry, 11.2 per cent were in

farm management, 9.8 per cent were in horticulture, and 8.9 per cent were in other areas of agriculture.

Loreen (10) in a study of the curricula in 49 teacher training institutions in the United States reported that an average of 54.6 semester credits were required in technical agriculture, and that approximately 11 credits were required in farm shop including methods of teaching farm mechanics.

In a study evaluating the undergraduate curriculum in agricultural education at South Carolina State College, Caldwell (4) reported that most all courses in technical agriculture were listed by the faculty as "should be required" or as a "desirable elective". The faculty also recommended that the semester credits of required work in technical agriculture be increased from 55 to 60.9 semester credits.

In the same study, Caldwell (4, p. 179) concluded that:

> Teachers and administrators seem to agree that the weakest phase of the agricultural education curriculum was in the area of the farming programs.

The Committee on Agricultural Teacher Training in Agricultural Engineering phase (1) stated the following general recommendations in regard to teaching of agricultural engineering courses:

1. That the course offerings be examined to make certain they are up-to-date and effectively meet the most pressing problems confronted by farmers -- not simplified professional engineering courses.
2. That pre-service, graduate, and non-credit in-service courses be considered parts of a total program and be planned to supplement each other.

3. That agricultural engineering technology courses provide fundamental training in basic principles so that teachers can keep up-to-date and adopt new techniques as they are developed. Additional courses emphasizing the application of principles, methods of teaching, and development of confidence should be provided to aid the trainee directly in his teaching.
4. That course work in agricultural engineering technology for teachers of agriculture should be related closely to the various enterprises in agricultural production. The ultimate goal of technical education is the production and processing of high quality agricultural products at low cost with minimum physical effort and to make possible a high standard of living on the farm.
5. That departments of agricultural engineering and agricultural education be encouraged to conduct research studies either jointly or individually, in an effort to develop improved programs of teacher education in agricultural engineering technology.

In a survey of the undergraduate program in agricultural education in the Southern Region, Scarborough (18) reported that a range of 43 to 67 semester credits were required in technical agriculture, of which 5 to 39 credits were required in introductory agricultural courses, 3 to 12 credits in agricultural economics, 3 to 17 credits in agricultural engineering, 0 to 4 credits in animal nutrition, and 0 to 28 credits in advanced courses.

An investigation of the agricultural education curriculum was conducted in New York State by Couch (5). He reported that practical application of the subject matter included in the courses in technical agriculture was reported lacking by a large percentage of the teachers. The scheduling of some

of the courses in technical agriculture during the summer session as off-campus courses seemed desirable.

In the same study Couch (5) indicated that the teachers of vocational agriculture evaluated the areas of technical agriculture as follows:

Agricultural economics courses -- Of 113 reporting evaluations, 87.6 per cent indicated that they were of great value and 23 per cent indicated that they needed more work.

Agricultural engineering courses -- Of 110 reporting evaluations, 81.81 per cent indicated that they were of great value and 58.18 per cent indicated that they needed more work.

Agronomy courses -- Of 111 reporting evaluations, 82.88 per cent indicated that they were of great value and 19.91 per cent indicated that they needed more work.

Animal husbandry courses -- Of 110 reporting evaluations, 85.45 per cent indicated that they were of great value and 20 per cent indicated that more work was needed.

Dairy industry courses -- Of 96 reporting evaluations, 66.66 per cent indicated that they were of great value and 6.25 per cent indicated that more course work was needed.

Forestry courses -- Of 35 reporting evaluations, 40 per cent indicated that they were of great value and none indicated the need for more work.

Poultry courses -- Of 108 reporting evaluations, 70.37 per cent indicated that they were of great value and 22.22

per cent indicated that they needed more work.

Vegetable courses -- Of 93 reporting evaluations, 66.66 per cent indicated that they were of great value and 17.20 per cent indicated a need for more work.

Pomology courses -- Of 100 reporting evaluations, 47 per cent indicated that they were of great value and 17 per cent indicated that they needed more work.

In regard to the amount of work needed in technical agriculture, Luster (11) indicated that the jurors proposed increasing the amount by approximately 9 per cent, or from an average of 83 quarter credits to 90 credits. It was proposed that an average of 25 quarter credits be required in animal science instead of 24 credits; an average of 23 credits in plant and soil sciences instead of 20 credits; an average of 20 credits in agricultural mechanics instead of 17 credits; an average of 18 credits in agricultural economics instead of 13 credits; and an average of 4 credits in general and/or electives instead of 9 credits.

Based upon the findings of his study, Luster (11) indicated that of the work designated in technical agriculture, from 25 to 30 per cent should be in animal science, from 22 to 28 per cent should be plant and soil science, from 18 to 25 per cent should be in agricultural mechanics, and from 15 to 22 per cent should be in agricultural economics.

The student body evaluating the curriculum in agricul-

tural education at the Ohio State University (24) indicated that, with few exceptions, the courses included in the area of technical agriculture were of great value in the preparation for teaching. The students also recommended an increase in number of quarter credits in technical agriculture from 69 credits to 73 credits.

Professional Education

Scarborough (18) indicated that a range of 15 to 27 semester credits were required in professional education.

Caldwell (4) reported that 19 semester credits were required in professional education but it was recommended by the faculty that the number be decreased to 17 semester credits. Courses in professional education were grouped by the faculty as "should be required" or as a "desirable elective".

In a similar study, Loreen (10) found a range of 3 to 15 semester credits or an average of 8.82 credits in agricultural education courses exclusive of student teaching. He reported a range of 15 to 38 semester credits or an average of 24.57 credits in education courses (including methods of teaching farm mechanics and student teaching). Of the 24.57 semester credits in education courses, 1.44 credits were for "methods of teaching farm mechanics" and 6.84 credits for student teaching.

Matela (12) indicated that 14.4 per cent of the courses required in the curriculum were professional education courses. The distribution of professional education courses was 19.9 per cent in education, 58.1 per cent in agricultural education, and 22.0 per cent in psychology.

According to the ratings of students at the Ohio State University (24), they believed that the professional education courses were of great value in the preparation for teaching.

Reported in the same study (24, p. 51), the alumni recommended that more emphasis should be given to the following areas of activity in student and apprentice teaching:

1. Working with adult and young farmer education including the use of advisory councils.
2. Developing a community and public relations and long-time program of instruction in a community.
3. Working with the total school program.
4. Guiding and counseling high school pupils and evaluating pupil progress.
5. Compiling and analyzing basic agricultural data and preparing and using educational reports and records.

In the summary of his investigation dealing with preservice curricula in agricultural education, Luster (11) reported that the total credits in professional education be reduced from 33 credits to 32 credits. Of these credits, 13 to 14 credits or an increase of 3 per cent should be in agricultural education courses exclusive of student teaching. The courses in student teaching be increased from 10 to 11 credits or an increase of 4 per cent. The courses taken in

education outside the department of agricultural education should be 3 fewer credits or 7 credits instead of 10 credits, or a decrease of 8 per cent.

In order to assist trainees in becoming good teachers, Luster (11, pp. 59-60) proposed the following as the goals of the professional education courses:

1. Students should be assisted in developing an understanding of growth and development of people and in special abilities in working with people so as to know how people learn to recognize individual differences and to understand the "why" of human behavior.
2. Classroom instruction in education and/or agricultural education courses and involving theory, methods and background to teaching should be provided as needed to contribute to and make the practical experiences of the student most meaningful and beneficial.
3. Classroom teaching in agricultural education should be provided by capable professors who have mastered the art of good teaching.
4. Adequate participation experience should be provided under typical conditions and supervised by competent persons, as is needed to develop initial confidence and competencies required to teach, plan and conduct a good program of vocational agriculture.

Curriculum Planning

Luster (11, p. 35) defined curriculum and the concept of curriculum planning as:

> ... The curriculum involves more than courses alone; it involves relationship between teacher and student, the learning situation, and methods of teaching. Any college-planned activity, supervised, sponsored or performed by college instructors certainly would be considered as part of the curriculum.

> It was felt that unless this broader concept of curriculum were present, teacher educators in planning programs could overlook items of considerable importance in pre-service education of prospective teachers of vocational agriculture.

The principles underlying the philosophy of curriculum development in agricultural education that pertain to general curriculum planning were summarized by Luster (11, pp. 34-36) as follows:

1. All contacts with students, the nature of the teacher, learning situation and method of teaching should be considered essential aspects of the curriculum.
2. The curriculum should include opportunities and experiences designated to develop personal, social and professional qualities inherent in good teachers of vocational agriculture.
3. Experience in Agricultural Education and/or education should begin early in the pre-service curriculum for teachers of vocational agriculture.
4. The nature and extent of the beginning teacher supervisory program and other in-service assistance influence the kind of pre-service program needed.
5. The curriculum should be based upon the experience, needs and interests of the students as individuals, citizens and members of the teaching profession.
6. Individual differences should be recognized and the curriculum should be flexible enough to meet specific individual problems and needs.
7. The teacher educational program should be functional and practical rather than merely academic in nature.
8. Theory and practice should be coordinated in all areas of pre-service preparation of teachers of vocational agriculture.
9. Institutions preparing teachers should promote an understanding of basic concepts, principles, relationships and generalizations rather than mere acquisition of well-organized facts and information.

10. The pre-service program for preparing teachers of vocational agriculture should be integrated in order that students may coordinate and relate subject matter fields to each other and to life situations and problems.

Student Teaching Participation Experience

In a study made by the United States Office of Education (22) it was found that some variation existed among states in the number of terms that student teaching experience was offered, and in the number of weeks required and credits granted for student teaching experience in the United States. The number of terms ranged from one to five terms. The number of weeks required off-campus ranged from four weeks to 48, and the number of credits granted ranged from two to 20 semester credits.

The scope of supervised teaching experienced by student teachers according to type of class in the United States (22) was as follows:

1. Number of high school class hours taught per student teacher ranged from two to 340 hours.
2. Number of visits to home farms of day-school students per student teacher ranged from one to 75 visits.
3. Number of hours young farmer class teaching time per student teacher ranged from one to 20 hours.
4. Number of instructional visits to home farms of young farmer students per student teacher ranged from one

to 15 visits.

5. Number of hours of adult farmer class teaching time per student teacher ranged from one to 21 hours.
6. Number of instructional visits to home farms of adult farmer students per student teacher ranged from one to 50 visits.

In a study of the adequacy of experiences in student teaching, Williams (25) reported that the majority of the teachers felt that their experiences in organizing, administrating and maintaining a department were above average. They thought that "working with advisory committee" and "enrolling new students" should receive more attention. Williams also reported that a number of teachers indicated that improvement in experiences in teaching farm mechanics would have been desirable. He found that the graduates rated student teaching as being the most valuable experience in their training. Particularly so, when the student teachers were allowed to actually teach classes and to have the responsibility of supervising students. Williams added that many graduates thought that the taking over of the entire department for a period of time was the highlight of their student-teaching experience.

According to Loreen (10), in his study of 49 institutions in the United States in 1953, the average number of weeks of student teaching required (full-time, off-campus) was 9.34

weeks, but the most common length of student teaching period was 6 weeks. The average number of credits granted for student teaching was 6.85 semester credits.

In the study at Ohio State University (24) the graduates recommended the continuation of two quarters of professional field experience, the scheduling of student teaching during two different quarters of the year, and a limitation in the number of trainees assigned to any teaching center to two during a given quarter.

In his study of curricula for preparing teachers of vocational agriculture in the North Central Region, Luster (11, pp. 61-62) indicated that the student teaching participating experiences should enable the trainee to:

1. Engage in practical experiences while studying professional courses in methods and theory in the classroom.
2. Attain adequate practical experience under typical conditions in teaching high school boys, young farmers and adult farmers.
3. Become familiar with professional organizations, understand their organization and purposes and be prepared to participate in and contribute to the work of these organizations.
4. Have adequate experience in supervising the farming programs of high school boys, young farmers and adult farmers on their home farms.
5. Work with an agricultural advisory or citizens committee in planning the local program of vocational agriculture.
6. Attain skill in using demonstrations in appropriate teaching situations.
7. Gain adequate experience in advising and working with the local chapter of F.A.A. in planning and conducting its program.
8. Have adequate experiences in individual counseling and in advising students.

9. Experience the preparing and using of audio-visual aids in actual teaching situations.
10. Work with the local school administrator in planning and conducting the local program of vocational agriculture.
11. Participate in organized classes and conferences with other student teachers, supervising teachers of vocational agriculture, and/or members of the Agriculture Education Staff, in which the problems of student teaching are discussed.
12. Participate in student teaching in a local community, off campus for sufficient time as is necessary to develop initial confidence and competencies required to teach and to conduct a good program of vocational agriculture.
13. Live full-time in the community in which they experience student teaching in order that they may observe, study and evaluate community conditions similar to those in which they expect to teach vocational agriculture.
14. Have adequate experiences in working with the parents of high school boys in developing better understandings and working relationships essential to an effective program of vocational agriculture.
15. Have adequate experience in maintaining and improving the library and physical facilities necessary for a good program of vocational agriculture.
16. Have first-hand experiences and responsibilities in community living that will give students insights in the cultural, social and religious mores of rural living.
17. Formulate a sound and consistent educational philosophy.

Caldwell (4) indicated that the staff, administrators, and teachers of vocational agriculture believed that more time should be allowed for practice teaching. The majority of the teachers preferred that their student teaching be done in two different schools.

Selection and Entrance Requirements of Candidates

The importance of the concept of what constitutes teaching success is ably presented in the following quotation by Sledge (19, pp. 1-2):

> It appears that many teacher-educating institutions have engaged in selecting and guiding teachers on unproven, yet respectable and acceptable, assumptions of what constitutes teaching competency. To evaluate the effectiveness of teacher-educating curricula and programs, teacher educators must know what competencies are needed in their trainees and how they are acquired. If competencies and characteristics that make up teaching success can be identified, it would be highly desirable and necessary to know them.

Phipps (16), in reporting about the necessity of farm experience in the backgrounds of candidates in agricultural education, stated that every candidate should have at least two years of farm experience since the age of 15 or, preferably, should have been reared on the farm. He further stated that many of the abilities learned on the farm will be helpful in teaching vocational agriculture.

In his study of relationship between pre-teaching characteristics and subsequent performance of teachers of vocational agriculture, Sledge (19), pointed out that negative relationships were found between some pre-teaching characteristics and selected areas of performance of teachers of vocational agriculture. He stated (19, pp. 7):

> ...For example: has it been established that a minimum of two years of farm experience beyond the age of 15 is a prerequisite to success and

effectiveness in teaching vocational agriculture? It appears that some of the assumptions regarding minimum qualifications of teachers might need to be re-examined.

Sledge (19, pp. 4-6) listed the positively associated areas of performance to certain pre-teaching characteristics as follows:

1. Working with people in community.
2. Conducting programs with all-day students.
3. Conducting programs with young and/or adult farmers.
4. Teaching farm mechanics.
5. Utilizing acceptable methods of teaching.

The areas of performance negatively associated with teaching characteristics were listed by Sledge (19, pp. 21-26) as follows:

1. Working with people in community.
2. Maintaining professional standards and relationships.
3. Providing on-farm instruction.
4. Maintaining administrative relationships.

No significant relationships were established between F.F.A. membership, years of high-school agriculture, "reading comprehension" scores, education 305, education 207, "basic English", and student-teaching marks, and the subsequent performance of teachers. No significant relationships were found between student-teaching marks and all pre-teaching characteristics.

In the study at the Ohio State University (24), it was recommended that increased emphasis should be given to the selection of prospective teachers of vocational agriculture. It was further recommended that more conferences for guidance and counseling purposes should be held between the student and his advisor, and that the criteria for selection of prospective candidates should be defined and classified.

Luster (11, pp. 48-50) listed the following principles pertaining to selection and guidance of candidates in agricultural education:

1. Selection of students should be such that only those who exhibit qualities and competencies associated with good teachers are certified to teach.
2. Students should have the assistance and services of functional guidance programs with competent counselors throughout the pre-service teacher education program.
3. Selection should be a continuous process throughout the pre-service education of teachers of vocational agriculture.

In a study of predicting farm shop manipulative achievement of college students at the Iowa State University, Rhea (17, pp. 36-37) reported the relationship between time spent on the farm and the Owens Test Scores on the achievement of college students. He stated:

> There was a little relationship between time spent on the farm and the Owens Test Scores; however, there was a highly significant difference on scores of students whose fathers were engaged in agriculture. Shop classes, shop experience and age had little effect on the scores; however, there was a highly significant difference in favor of the student who had completed one or more years of physics. From the practical point of view it will have to be recognized that students with physics background will make several points higher than the non-physics students and the scores must be interpreted accordingly.

Rhea (17), in discussing the achievement of college students in farm shop indicated that it is often necessary that classes in farm mechanics be sectioned, and that it would be advisable to use the Owens Test Scores instead of high school

grades or A.C.E. scores for sectioning. He explained that if the ability of the student can be ascertained before the classes start, the instructors could do a better job of teaching the students. Rhea drew from the analysis the following inferences concerning the value of high school grade, the A.C.E. score and the Owens Test Score in farm shop manipulative achievement of college students (17, p. 38):

1. Predictive value of the high school grade and the A.C.E. score is so low it would be of no practical use.
2. In sectioning farm mechanics classes, other factors being equal, the Owens Test Scores would be of greater value than either high school grade or A.C.E. score.

Total Credit Hours Required in the Curriculum

According to the study conducted by the United States Office of Education (21) in 1959-1960 concerning the curricula in agricultural education, it was reported that an average of approximately 135 semester credits, in the institutions operating on a semester system, and an average of approximately 204 quarter credits, in the institutions operating on a quarter system, were required for graduation of candidates in agricultural education. The approximate distribution of the required credit hours for graduation was as below:

1. General education subjects - 40 per cent.
2. Technical agriculture subjects - 40 per cent.
3. Professional education subjects - 12.5 per cent.

4. Miscellaneous, ROTC, hygiene and physical education, etc. - 7.5 per cent.

In his study of curricula in agricultural education in the North Central Region, Luster (11) indicated that from a minimum of 190 quarter credits to a maximum of 210 credits, exclusive of work in hygiene, physical education and military science, should be required for graduation of candidates in agricultural education. The recommended distribution of the credits required for graduation was as follows:

1. General education - an average of 71 quarter credits.
2. Technical agriculture - an average of 90 quarter credits.
3. Professional education - an average of 8 quarter credits.
4. Electives - an average of 8 quarter credits.

According to findings of the study made by Loreen (11), an average of 141.5 semester credits were required for a Bachelor of Science degree in agricultural education.

Based upon the findings of the study made by Caldwell (4), 137 semester credits were recommended for graduation in agricultural education. These credits were distributed as follows:

1. General education - 59.4 semester credits.
2. Technical agriculture - 60.9 semester credits.
3. Professional education - 17.0 semester credits.

4. Free electives - 4.2 semester credits.

In the evaluative study at the Ohio State University (24), the undergraduate majors proposed that an average of 212 quarter credits should be required for graduation in agricultural education. These credits were to be distributed as follows:

1. Natural sciences - an average of 36 quarter credit hours.
2. Social sciences and humanities - an average of 27 quarter credit hours.
3. Technical agriculture - an average of 73 quarter credit hours.
4. Professional education - an average of 38 quarter credit hours.
5. Free electives - an average of 22 quarter credit hours.
6. Military science and physical education - 16 quarter credit hours.[1]

In the study of content of curricula for teachers of vocational agriculture in separate land-grant colleges, Matela (12) reported the following distribution of subject matter:

1. Science - 23.6 per cent.
2. Humanities - 9.0 per cent.

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[1]Fixed by the University.

3. Technical agriculture - 38.0 per cent.
4. Professional education - 14.4 per cent.
5. Other required content - 5.9 per cent.
6. Electives - 9.1 per cent.

METHOD OF PROCEDURE

Purpose of the Study

The primary purpose of this study was to analyze the curricula in agricultural education of the various land-grant colleges and state universities to determine similarities, differences, innovations and trends in general education, technical agriculture and professional education courses and credits.

Specific objectives in conducting this study were:

1. To identify in detail the emphasis placed on curricular divisions and course areas in the agricultural education curricula in use in 48 land-grant colleges and state universities in the United States.
2. To determine the graduation requirements of agricultural education majors according to the number of credits in specific courses required of all majors, credits required as prescribed electives in the various curricular divisions, and the credits required of free elective courses.
3. To identify selected features and characteristics of the various curricula in agricultural education, including:
    a. Major improvements that have been made by the individual institutions in the agricultural

education curricula during the last two years.

b. The significant changes in the present curricula that are planned to be put into effect in the immediate future.

c. Professional participation experiences provided the agricultural education trainees.

d. Qualifications required and selection of candidates entering the agricultural education curriculum.

4. To obtain information concerning standards that should be met in planning future programs in agricultural education.

5. To obtain information that may serve as a guide in improving the present curriculum in agricultural education at the University of Baghdad, Iraq.

Basic Assumptions

1. It was assumed that the teacher trainers were capable, by virtue of their experience, to make valid recommendations for curricula in agricultural education.

2. It was assumed that the teacher trainers had a high degree of integrity and would use high standards in supplying the information and in making recommendations.

3. It was further assumed that the information and

recommendations provided would be reliable and correct.

4. It was assumed that the opinions of the teacher trainers concerning emphasis placed on curricular divisions, subject matter areas, and courses would serve as a guide in curriculum planning.
5. It was assumed that this study on a national scale would discover the similarities and differences in agricultural education curricula among the land-grant institutions in the United States and would contribute to the improvement of the curricula in the various participating institutions.
6. It was assumed that any contributions made toward general improvement of curricula would result in improved preparation of trainees in agricultural education.

Scope and Limitations of the Study

This investigation was limited to the undergraduate curricula in agricultural education at the 48 land-grant institutions in the United States. The study was concerned with the curricular divisions, subject matter areas, and courses included in present curricula, and the curriculum standards that should be met in planning future programs in agricultural education. Though the study may reveal institu-

tional differences and similarities, on state or regional basis; it was not, however, intended to be used to evaluate the individual institutions included in this study. This study was not concerned with content in any course area.

The data used in this study were limited primarily to the information supplied on questionnaires returned by the heads of departments of agricultural education and or by staff members in agricultural education who were selected by the head of the departments to provide the information. Some information was obtained from the catalogs of individual institutions. The persons who provided information, the institutions involved in this investigation, and the state in which the institution was located may be found in Appendix A.

Responses from Rhode Island, New Jersey and Massachusetts indicated that these states had no teacher education curricula in agricultural education. No responses were received from the head teacher trainers in agricultural education in Florida and West Virginia. Data was obtained from only 43 states.

The Questionnaire

The objectives of the study were carefully outlined before an attempt was made to construct a questionnaire. An intensive study was made of pertinent literature in the

field of preservice agricultural education programs to discover methods and techniques to be used in collecting information for this study.

Due to the nature of the problem, location of the informants, the time and the conditions, it was believed that the questionnaire was the appropriate technique for collecting the data. The questionnaire was constructed carefully to obtain the data needed for this investigation based upon the objectives or purposes mentioned previously. A copy of the questionnaire may be found in Appendix C.

Pretest of Questionnaire

It was felt that it was necessary to pretest the questionnaire before mailing it. The pretesting was done in an agricultural education graduate seminar in November, 1961. Questions and items that were not clear were revised before mailing the questionnaire.

Cover Letter

The questionnaires were mailed to the heads of departments of agricultural education at the 48 institutions in the United States on December 5, 1961. A cover letter was enclosed with each questionnaire. The objectives and purposes of the study were stated in the cover letter. A copy of the cover letter can be found in Appendix B.

Return of Questionnaires

Forty-three of 48 mailed questionnaires were returned before or on January 1, 1962. Follow-up letters were sent on January 30, 1962 to the five institutions that had not responded to the first request. Three of the five institutions responded to the follow-up letter.

Classification of Curricular Divisions, Areas and Courses

General education, technical agriculture, and professional education were the major divisions used in the classification of the content of the curricula in agricultural education. Each of the major divisions was subdivided into its own curricular areas. In addition, each curricular area was subdivided into its own course areas.

The course work in each curricular division area was classified according to credits required, credits of prescribed electives and free electives. The credits required in each of these classifications were listed according to the division, curricular area, and course.

Required credits

Required credits included total number of credits required of all candidates majoring in agricultural education. They consisted of credits of required and specific courses for each curricular division, curricular area, and course.

Prescribed elective credits

Prescribed elective credits included the total number of required credits of course work that the student could elect from an approved limited list of courses. The student could apply the credits toward the requirements of course work in each curricular division or area.

Free elective credits

Free elective credits included the total number of credits of course work that the student was free to elect in meeting the free elective requirements in each curricular division or area.

Summary of Method of Procedure

The procedures employed in this study were as follows:

1. Conducted a comprehensive review of similar and/or related studies pertaining to preservice curriculum in agricultural education at the undergraduate college level.
2. Constructed the questionnaire as data gathering instrument.
3. Pretested the questionnaire for improvements, suggestions, clarity and ease of checking.

4. Classified, compiled, tabulated and analyzed the data.
5. Calculating machines were used for tabulating and summarizing the data into totals and medians.
6. Where quarter credits were used, they were converted to semester credits for this study. This was necessary since the majority of institutions involved in the study were operating on the semester plan. The quarter credits were multiplied by 2/3. For convenience, the fractions were dropped and the nearest whole number was used. Of the 43 institutions whose curricula were included in this investigation, 28 operated on the semester plan.

FINDINGS

The results of the investigation are reported in two parts:

1. The status of preservice curricula for teacher education in agriculture.
2. Credits recommended as curricular standards in agricultural education for individual departments.

The Status of Preservice Curricula for Teacher Education in Agriculture

Information concerning the status of preservice curricula for teacher education in agriculture at the 43 land-grant institutions is presented, by region and state, in Tables 1 through 28. Data in Tables 1 through 5 relate to an analysis of curricular credit content according to extent the credits were required, the total semester credits required for graduation, and an analysis of the composition of curricula, according to divisions and areas. The distribution of semester credits in specific courses required of all agricultural education majors, according to each curricular area, is revealed in Tables 6 through 23. The findings relative to selected features of the curricula in agricultural education namely, selection of candidates entering the curriculum, time when candidates enter the curriculum, student teaching participation experience, and summer experience appear in Tables

24 through 28. Improvements that have been made in agricultural education curricula during the past two years and the changes desired in the present curricula, as reported by the person who provided the information for each institution, are presented. Due to the nature of the responses, the use of tables was not feasible. The responses relative to improvements made and changes desired in curricula are reported by region and state.

Analysis of curricular credit requirements according to extent they were required

Graduation requirements Semester credits required for a degree in agricultural education by the 43 institutions included in the study varied greatly as indicated by data in Table 1. It may be observed, however, that very small differences in number of semester credits required for graduation existed among the four regions. The median total credits required for graduation was 136 credits in the Central Region and 133 credits in the North Atlantic Region. The Pacific Region had a median of 140 credits, whereas the median in the Southern Region was 143 credits.

As shown by data in Table 1, great variation in credits required for graduation existed among the states of a specific region. In the Central Region, this variation ranged from a low of 124 to 127 credits at the University of Wisconsin to a high of 150 credits at the South Dakota State College. In

Table 1. Semester credits of required courses, prescribed electives and free electives required for graduation in agricultural education by region and state

Region and state	Specific required courses	Prescribed electives	Free electives	Total credits for graduation
A. Central Region				
Illinois	103-110	17	10	130-137
Indiana	122	9	5	136
Iowa	111	18	4	133
Kansas	97	39	0	136
Kentucky	85-87	48	5-10	138-145
Michigan	107	17	5	129
Minnesota	85	39	12	136
Missouri	107	18	11	136
Nebraska	105	17	6	128
North Dakota	113	12	12	137
Ohio	64	55-74	6-21	140-144
South Dakota	131	19	0	150
Wisconsin	102-105	9	13	124-127
Median for region	107	18	7.5	136
B. North Atlantic Region				
Connecticut	32-42	64	28	124-134
Delaware	98	25	11	134
Maine	91	31	10	132
Maryland	120	0	12	132
New Hampshire	128	18	0	146
New York	60	58	2	120
Pennsylvania	104-107	27	9	140-143
Vermont	119	0	23-38	142-157
Median for region	101.75	27.5	10.5	133

Table 1. (Continued)

Region and state	Specific required courses	Prescribed electives	Free electives	Total credits for graduation
C. Pacific Region				
Arizona	108-110	17	5	130-132
California	86	54	0	140
Colorado	136	8	4	148
Idaho	91	41	16	148
Montana	105	17	14	136
Nevada	91	36	9	136
New Mexico	131	15	5	151
Oregon	102-104	0	9	111-113
Utah	80	45	5	130
Washington	125	15	18	158
Wyoming	140	0	0	140
Median for region	105	17	5	140
D. Southern Region				
Alabama	146	0	0	146
Arkansas	103	0	29	132
Georgia	107	23	9	139
Louisiana	139	5	0	144
Mississippi	137	0	7	144
North Carolina	103	22	12	137
Oklahoma	92-95	38	2	132-135
South Carolina	134	0	10	144
Tennessee	102	32	7	141
Texas	131	0	13	144
Virginia	108	22	13	143
Median for region	108	5	9	143

the North Atlantic Region, the variation amounted to a low of 120 credits at Cornell University (New York) to a high of 142 to 157 credits at the University of Vermont. The credits required for graduation by states in the Pacific Region varied from a low of 111 to 113 credits at the Oregon State University to a high of 158 credits at the Washington State University. In the Southern Region, the credits required for graduation varied from a low of 132 credits at the University of Arkansas to a high of 146 credits at Auburn University (Alabama).

Total semester credits of required courses The total semester credits in specific courses required of all agricultural education majors as revealed in Table 1 indicate that small differences in number of credits required existed among the regions. The median number of credits in specific courses required ranged from a low of 101.75 credits in the North Atlantic Region to a high of 108 credits in the Southern Region. Greater variations existed among the institutions within a region. In the Central Region, the variation ranged from a low of 64 credits at the Ohio State University to a high of 131 credits at the South Dakota State College. Much greater differences existed between the University of Connecticut with a low of 32 to 42 credits and the University of New Hampshire with a high of 128 credits, in the North Atlantic Region. In the Pacific Region, the requirements varied from a low of 80 credits at the Utah State University to a

high of 140 credits at the University of Wyoming. The range in the Southern Region ranged from a low of 92 credits at the Oklahoma State University to a high of 146 credits at Auburn University.

Total semester credits of prescribed elective courses

Presented in Table 1 are data concerning the number of semester credits of prescribed elective courses included in the curricula. The total credits in prescribed electives ranged from a median of 5 credits in the Southern Region to a median of 27.5 credits in the North Atlantic Region. It may be observed that very large differences in number of credits existed among the institutions within the various regions. The total credits in prescribed electives required in the Central Region varied from a low of 9 credits at Purdue University (Indiana) to a high of 55 credits at the Ohio State University. In the North Atlantic Region, the range was from a low of "none" at the University of Maryland and the University of Vermont to a high of 58 credits at Cornell University. The prescribed elective credits ranged from a low of "none" at the Oregon State University and the University of Wyoming to a high of 54 credits at the University of California. In the Southern Region, Auburn University, the University of Arkansas, the Mississippi State University, Clemson College (South Carolina), and the A. and M. College of Texas required "none" but the highest required in the region was 38 credits

at the Oklahoma State University.

Total semester credits of free elective courses Data presented in Table 1 indicate that the total credits of free elective courses required varied from a median of 5 credits in the Pacific Region to a median of 10.5 credits in the North Atlantic Region. The variation among the institutions in the Central Region varied from a low of "none" at the Kansas State University and the South Dakota State College to a high of 13 credits at the University of Wisconsin. In the North Atlantic Region, the credits ranged from a low of "none" at the University of New Hampshire to a high of 23 to 38 credits at the University of Vermont. The free elective credits in the Pacific Region varied from "none" at the University of California and the University of Wyoming to a high of 18 credits at the Washington State University. The range in the Southern Region was from "none" at Auburn University and the Louisiana State University to a high of 29 credits at the University of Arkansas.

Semester credits in curricular divisions and extent to which they were required

General education division Table 2 presents an analysis of the total semester credits required in general education and a division of credits according to specific required, prescribed elective, and free elective courses. It may be

Table 2. Semester credits in general education, technical agriculture, professional education, and total credits required for graduation, by region and state, according to extent they are required

Region and state	General education				Technical agriculture				Professional education				Total credits for graduation
	R[a]	P[a]	F[a]	Total	R	P	F	Total	R	P	F	Total	
A. Central Region													
Illinois	51-58	2	3	56-63	35	15	4	54	17	0	3	20	130-137
Indiana	61	0	2	63	43	9	3	55	18	0	0	18	136
Iowa	43	5	0	48	43	13	2	58	25	0	2	27	133
Kansas	40	19	0	59	37	20	0	57	20	0	0	20	136
Kentucky	36-38	16	2-5	54-59	31	29	3-5	63-65	18	3	0	21	138-145
Michigan	56	0	2	58	31	17	2	50	20	0	1	21	129
Minnesota	40	10	6	56	24	29	6	59	21	0	0	21	136
Missouri	49	0	5	54	34	18	6	58	24	0	0	24	136
Nebraska	49	3	3	55	34	14	3	51	22	0	0	22	128
N.Dakota	48	0	6	54	43	12	6	61	22	0	0	22	137
Ohio	9	50-64	3-10	69-76	40	0	3-11	43-51	15	5-10	0	20-25	140-144
S.Dakota	58	14	0	72	51	3	0	54	22	2	0	24	150
Wisconsin	40-43	0	6.5	46.5-49.5	39	9	6.5	54.5	23	0	0	23	124-127
Median for region	48	3	3	56.5	37	14	4	55	21	0	0	22	136

[a]R - required; P - prescribed; F - free electives.

Table 2. (Continued)

Region and state	General education				Technical agriculture				Professional education				Total credits for graduation
	R	P	F	Total	R	P	F	Total	R	P	F	Total	
B. North Atlantic Region													
Connecticut	9-17	25	14	48-56	1	39	14	54	22-24[b]	0	0	22-24	124-134
Delaware	35	15	5	55	42	10	6	58	21	0	0	21	134
Maine	40	10	5	55	36	21	5	62	15	0	0	15	132
Maryland	54	0	6	60	40	0	6	46	26	0	0	26	132
N.Hampshire	56	10	0	66	41	8	0	49	31	0	0	31	146
New York	9	36	1	46	46	9	1	56	15	3	0	18	120
Pennsylvania	39-42	21	4	64-67	40	6	5	51	25	0	0	25	140-143
Vermont	48	0	14-19	62-73	54	0	9-19	63-73	17	0	0	17	142-163
Median for region	40.25	12.5	5	57.5	40.5	8.5	5.5	55	22	0	0	22	133

[b]Includes requirements for certification.

Table 2. (Continued)

Region and state	General education				Technical agriculture				Professional education				Total credits for graduation
	R	P	F	Total	R	P	F	Total	R	P	F	Total	
C. Pacific Region													
Arizona	55-57	0	2	57-59	33	16	3	52	20	1	0	21	130-132
California	51	0	0	51	18	42	0	60	17	12	0	29	140
Colorado	57	4	2	63	53	4	2	59	26	0	0	26	148
Idaho	34	19	16	69	28	22	0	50	29	0	0	29	148
Montana	47	7	7	61	38	10	7	55	20	0	0	20	136
Nevada	32	11	9	52	35	25	0	60	24	0	0	24	136
N.Mexico	53	7	3	63	50	8	2	60	28	0	0	28	151
Oregon	49-51	0	4	53-55	30	0	5	35	23	0	0	23	111-113
Utah	34	16	0	50	24	27	5	56	22	2	0	24	130
Washington	56	0	9	65	41	15	9	65	28	0	0	28	158
Wyoming	54	0	0	54	57	0	0	57	29	0	0	29	140
Median for region	51	4	3	58	35	16	2	57	24	0	0	26	140

Table 2. (Continued)

Region and state	General education				Technical agriculture				Professional education				Total credits for graduation
	R	P	F	Total	R	P	F	Total	R	P	F	Total	
d. Southern Region													
Alabama	55	0	0	55	53	0	0	53	38	0	0	38	146
Arkansas	45	0	11	56	40	0	18	58	18	0	0	18	132
Georgia	44	23	0	67	41	0	9	50	22	0	0	22	139
Louisiana	62	3	0	65	59	2	0	61	18	0	0	18	144
Mississippi	52	0	3	55	63	0	4	67	22	0	0	22	144
N.Carolina	49	16	6	71	30	6	6	42	24	0	0	24	137
Oklahoma	40-46	6	0	46-52	31	32	2	65	21	0	0	21	132-138
S.Carolina	61	0	5	66	55	0	5	60	18	0	0	18	144
Tennessee	52	4	3	59	28	26	4	58	22	2	0	24	141
Texas	51	0	6	57	62	0	7	69	18	0	0	18	144
Virginia[c]	55	14	6	75	36	6	7	49	17	2	0	17	143
Median for region	52	3	3	59	41	0	5	58	21	0	0	21	143

[c]Technical agriculture curriculum.

observed that small differences in numbers of credits required existed among the regions. The median total number of credits required in general education varied among the regions from a low of 56.5 credits in the Central Region to a median of 59 credits in the Southern Region. The number of credits required in specific courses in general education in the four regions ranged from a median of 40.25 credits in the North Atlantic Region to a median of 52 credits in the Southern Region. The Louisiana State University with 62 credits, Purdue University and Clemson College with 61 credits required were highest in the number of credits required in specific courses. The Ohio State University with 9 credits, the University of Connecticut with 9 to 17 credits and Cornell University with 9 credits required in specific courses were low.

The prescribed elective credits in general education varied greatly among the regions. The variation ranged from a median of 3 credits in the Central and Southern Regions to 12.5 credits in the North Atlantic Region. A median of 3 credits in prescribed electives in general education was required in the Central Region. The credits in the region varied from a low of "none" at Purdue University, the Michigan State University, the University of Missouri, the North Dakota Agricultural College and the University of Wisconsin to a high of 50 to 64 credits at the Ohio State University. In the North Atlantic Region, the range was from "none" at

the University of Maryland and the University of Vermont to a high of 36 credits at Cornell University. The credits in prescribed electives in the Pacific Region ranged from "none" at the University of Arizona, the University of California, the Oregon State University, the Utah State University, the Washington State University, and the University of Wyoming to a high of 19 credits at the University of Idaho. The range in the Southern Region varied from a low of "none" at Auburn University, the University of Arkansas, the Mississippi State University, Clemson College and at the A. and M. College of Texas to a high of 23 credits at the University of Georgia.

The requirements of free elective courses in general education, as the data in Table 2 indicate, varied slightly among the regions from a median of 3 credits in the Central, Pacific and Southern Regions to a median of 5 credits in the North Atlantic Region. The free elective credits in general education required by the 43 institutions ranged from "none" in 11 institutions to a high of 14 and 19 credits at the University of Vermont and the University of Idaho, respectively.

Technical agriculture division An analysis of the total semester credits in technical agriculture according to extent they are required, as presented in Table 2, reveals a wide variation in credits required in specific courses existed among the institutions within the regions. The variation in

the Central Region ranged from a low of 24 credits at the University of Minnesota to a high of 51 credits at the South Dakota State College. The University of Connecticut with a low of 1 credit required to a high of 54 credits required at the University of Vermont was the range in the North Atlantic Region. The credits in specific required courses in technical agriculture in the Pacific Region varied from a low of 18 credits at the University of California to a high of 57 credits at the University of Wyoming.

In the Southern Region, the University of Tennessee required only 28 credits, whereas the A. and M. College of Texas required a high of 62 credits. As to the variations among the regions in the number of credits required in specific courses in technical agriculture, the data in Table 2 indicate that there were small differences. The median varied among the regions from a low of 35 credits in the Pacific Region to a high of 40.5 to 41 credits in the North Atlantic and Southern Regions.

The University of Connecticut with 1 and the University of California with 18 credits required were low in number of credits required in specific courses in technical agriculture. The largest number of credits required was 63 credits at the A. and M. college of Texas and 61 credits at the Mississippi State University.

The total number of credits required in technical agri-

culture, as indicated by the regional medians in Table 2, ranged from a low of 55 credits in the Central and North Atlantic Regions to a median of 58 credits in the Southern Region.

The number of semester credits in prescribed elective courses in technical agriculture required are revealed in Table 2. A wide variation existed among the regions. The variation ranged from a low median of zero in the Southern Region to a median of 16 credits in the Pacific Region. Much greater variations existed among the institutions in the regions. Eleven of the 43 institutions included in the investigation required no credits in prescribed electives in technical agriculture. The other institutions required from a low of 2 credits at the Louisiana State University to a high of 42 credits at the University of California.

The number of semester credits of free elective courses in technical agriculture required is presented in Table 2. The regional median varied from a low of 2 credits in the Pacific Region to a high of 6 credits in the Southern Region. Nine institutions required no free elective courses in technical agriculture. The remaining institutions differed greatly in credits of free elective courses required. They varied from 1 credit at Cornell University to 18 credits at the University of Arkansas and 9 to 19 credits at the University of Vermont.

Professional education division The distribution of semester credits in professional education according to the extent to which they were required is indicated by data in Table 2. There were slight differences among the regions concerning the number of credits required in specific courses in professional education. The Central and the Southern Regions had a median of 21 credits, whereas the North Atlantic and Pacific Regions had medians of 22 and 24 respectively. Greater differences existed among the institutions. The largest number of credits in specific courses in professional education required was 38 credits at Auburn University and the lowest number was 15 required by the Ohio State University, the University of Maine, and Cornell University.

According to data in Table 2, 34 institutions required no prescribed elective credits in professional education. The number of credits required by the remaining institutions varied from a low of 1 credit at the University of Arizona to 12 credits at the University of California.

Forty of the 43 institutions involved in the investigation did not require students to earn credits in free elective courses in professional education. The Michigan State University with 1 credit required, the Iowa State University with 2 credits, and the University of Illinois with 3 credits were the only institutions requiring credits in free elective courses in professional education.

There were small differences in the total number of credits in professional education required among the four regions. The median total number of credits in professional education required among the regions varied from 21 credits in the Southern Region to 26 credits in the North Atlantic Region. The Auburn University was high with a total of 38 credits. The University of Maine was low with 15 credits.

Semester credits in specific curricular areas required of all agricultural education majors

General education areas An examination of the data in Table 3 relating to the number of semester credits in specific courses in general education curricular areas required indicated that some variation existed among the regions. The range was from a median of 40.5 credits in the North Atlantic Region to a high of 53 credits in the Pacific Region. Great variation existed among the 43 institutions included in the investigation. The Ohio State University and Cornell University with only 9 credits, and the University of Connecticut with 9 to 17 credits required, were lowest in number of semester credits required in specific courses in general education areas. The Purdue University and Clemson College with 61 credits required, and the Louisiana State University with 62 credits required were high.

As indicated by data in Table 3, the biological science area ranked highest among the curricular areas in number of

Table 3. Distribution of semester credits in general education curricular areas required of all agricultural education majors, by region and state

Curricular area	A. Central Region													Median for region
	Ill.	Ind.	Iowa	Kan.	Ken.	Mich.	Minn.	Mo.	Neb.	N. Dak.	Ohio	S. Dak.	Wis.	
Biological sciences	8	15	9	8	8	13	16	5	16	13	0	11	17-18	11
Communi-cations	9	12	10	11	6	6	10	12	8	8	6	12	8	9
Humanities	4	3	1	0	0	8	0	0	0	0	0	4	3	0
Math. and statistics	3-5	6	4	3	3	3	2	3	2	8	0	3	0	3
Physical education, hygiene & military science	8	8	4	4	11	6	0	8	4	4	3	6	R[a]	4
Physical sciences	10-14	14	11	11	8-10	10	7	16	10	13	0	11	8-10	11
Social sciences	9-10	3	4	3	0	10	4	5	9	2	0	10	4	4
Other, not specified	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Total credits general education	51-58	61	43	40	36-38	56	40	49	49	48	9	58	40-43	48

[a]Required but no credit given.

Table 3. (Continued)

Curricular area	B. North Atlantic Region								Median for region
	Conn.	Del.	Maine	Maryland	N.Hamp.	N.Y.	Penn.	Vermont	
Biological sciences	0	11	18	11	15	0	3	4	7.5
Communications	6	6	10	14	12	6	9	15	9.5
Humanities	0	1	0	6	0	0	4	0	0
Math. and statistics	0	3	0	0	3	0	3	6	1.5
Physical education, hygiene & military science	0-8	6	R[b]	9	7	0	7-10	12	6.5
Physical sciences	0	8	12	8	12	3	7	8	8
Social sciences	3	0	0	6	7	0	6	3	3
Other, not specified	0	0	0	0	0	0	0	0	0
Total credits general education	9-17	35	40	54	56	9	39-42	48	40.25

[b]Required 7 credits but do not count toward graduation requirements.

Table 3. (Continued)

Curricular area	C. Pacific Region											Median for region
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.Mex.	Ore.	Utah	Wash.	Wyo.	
Biological sciences	16	13	17	15	10	5	16	8	13	9	8	13
Communi-cations	9	6	8	0	8	2	9	12-14	6	11	9	8
Humanities	3	6	7	15	0	3	0	4	2	3	8	3
Math. and statistics	3	0	9	4	4	3	3	3	0	6	4	3
Physical education, hygiene & military science	9	8	7	0	6	8	10	4	0	5	8	7
Physical sciences	12-14	12	7	0	13	5	12	8	10	12	9	10
Social sciences	3	6	2	0	6	6	3	10	3	10	8	6
Other, not specified	0	0	0	1	0	0	0	0	0	0	0	0
Total credits general education	55-57	51	57	34	47	32	53	49-51	34	56	54	53

Table 3. (Continued)

Curricular area	C. Southern Region											Median for region
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.	
Biological sciences	15	12	0	10	10	8	10	14	13	9	13	10
Communi-cations	7	8	10	12	9	6	9-11	15	8	10	10	10
Humanities	0	6	3	9	6	3	3	3	0	6	0	3
Math. and statistics	3	3	3	6	3	4	0	4	4	3	8	3
Physical education, hygiene & military science	8	0	8	12	6	8	4-8	7	5	0	0	6
Physical sciences	10	10	17	7	8	8	8	12	18	14	19	10
Social sciences	12	0	3	6	9	12	6	6	4	9	5	6
Other, not specified	0	6	0	0	1	0	0	0	0	0	0	0
Total credits general education	55	45	44	62	52	49	40-46	61	52	51	55	50

semester credits in specific courses. The median number of credits in biological sciences required varied from a low of 7.5 in the North Atlantic Region to 13 credits in the Pacific Region. Great differences existed among the institutions in the four regions. The range was from "none" at Cornell University, the University of Georgia, the Ohio State University, and the University of Connecticut to a high of 17 credits at the Colorado State University and 18 credits at the University of Maine and the University of Wisconsin.

The second high ranking area in general education was the physical science area. The number of credits in the physical sciences varied greatly among the institutions from "none" at the Ohio State University, the University of Connecticut, and the University of Idaho to a high of 18 credits at the University of Tennessee and 19 credits at the Virginia Polytechnic Institute.

In the communications area, the required credits in specific courses varied among the regions from a median of 8 in the Pacific Region to 10 credits in the Southern Region. The University of Idaho required no credits in specific courses in the communications area. In the area of humanities, there was little variation among the regions. The credits varied from a median of zero in the Central and North Atlantic Regions to a median of 3 credits in the Pacific and Southern Regions. Of the 43 institutions, 17 universities

did not require specific courses in the humanities area.

Credits required in specific courses in mathematics and statistics varied greatly among the institutions. Nine of the 43 institutions required no credits in specific courses in mathematics and statistics. The largest number of credits in mathematics and statistics was 9 credits required by the Colorado State University.

Eight institutions required no credits in specific courses in the physical education, hygiene and military science area. The University of Vermont and the Louisiana State University, with 12 credits required, were highest in this regard. On a regional level, the number of credits in physical education, hygiene and military sciences varied from a median of 4 in the Central Region to a median of 7 credits in the Pacific Region. In the area of social sciences, seven institutions did not require any specific courses. The Auburn University and the North Carolina State College required 12 credits. On the regional level the number of credits varied from a median of 3 credits in the North Atlantic Region to 6 credits in the Pacific and Southern Regions.

Technical agriculture areas An analysis of the semester credits required in specific courses in technical agriculture, as revealed in Table 4, indicated that the total credits varied slightly among the regions from a median of 35 credits in the Pacific Region to 41 credits in the Southern

Table 4. Distribution of semester credits in technical agriculture curricular areas required of all agricultural education majors, by region and state

Curricular area	A. Central Region													Median for region
	Ill.	Ind.	Iowa	Kan.	Ken.	Mich.	Minn.	Mo.	Neb.	N. Dak.	Ohio	S. Dak.	Wis.	
Agricultural economics & rural sociology	6	6	10.6	5	8	8.6	4	11	6	5.9	6.7	6	11	6.7
Agricultural engineering	9	6	9.9	16	9	11.8	7.9	9	7	12.5	10	8	5	9
General animal science	6	9	5.3	4	7	6.6	2.6	6	9	5.3	6.6	11.1	7	6.6
Dairy science	3	0	0	0	0	0	2	0	3	2	3.3	2.6	3	2
Livestock enterprises	0	0	2	0	0	0	0	0	0	2	3.3	2	3	0
Crop science	4	10	4.6	4	0	3.3	4.6	3	6	4	2.7	7.3	3	4
Forestry	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Horticulture	0	3	2	0	0	0	0	0	0	2	3.3	2	3	0
Soil science	4	3	5.2	4	4	0	2.6	5	3	5.3	5.3	4	4	4
Other, not specified	3	3	3.3	4	3	0.7	0.3	0	0	2	0	8	0	-
Total credits technical agriculture	35	43	43	37	31	31	24	34	34	43	40	51	39	37

Table 4. (Continued)

Curricular area	B. North Atlantic Region								Median for region
	Conn.	Del.	Maine	Maryland	N.Hamp.	N.Y.	Penn.	Vermont	
Agricultural economics & rural sociology	0.7	9	13	3	8	5	3	15	6.5
Agricultural engineering	0[a]	9	5	8	7	11	9	12	8.5
General animal science	0[a]	3	3	6	3	7	9	3	3
Dairy science	0[a]	4	6	3	3	7	3	6	3.5
Livestock enterprises	0[a]	3	3	3	3	3	3	3	3
Crop science	0[a]	6	0	8	3	4	4	3	3.5
Forestry	0[a]	0	0	0	0	0	3	6	0
Horticulture	0[a]	3	0	3	6	3	0	0	1.5
Soil science	0[a]	4	6	4	7	5	4	3	4
Other, not specified	0	1	0	2	0	0	2	3	-
Total credits technical agriculture	0.7	42	36	40	41	45	40	54	40.5

[a]Wide variation (none was specified).

Table 4. (Continued)

Curricular area	C. Pacific Region											Median for region
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.Mex.	Ore.	Utah	Wash.	Wyo.	
Agricultural economics & rural sociology	4	-[b]	9.3	7	6.3	7	12	5.3	0.7	6	10	6.3
Agricultural engineering	12	-[b]	11.3	12	12	17	12	8	16	6	10	12
General animal science	6	-[b]	8.5	6	10.6	3	7	4	3	9	14	6
Dairy science	0	-[b]	2	0	0	0	4	0	0	3	3	0
Livestock enterprises	0	-[b]	7.3	0	0	0	3	2	0	3	3	0
Crop science	8	-[b]	4	3	6.6	4	4	5	0	3	14	4
Forestry	0	-[b]	0	0	0	0	0	0	0	0	0	0
Horticulture	0	-[b]	3.3	0	0	0	4	2	2	3	0	0
Soil science	3	3	7.3	0	2.6	4	4	4	2.5	6	3	3
Other, not specified	0	15	0	0	0	0	0	0	0	2	0	-
Total credits technical agriculture	33	18	53	28	38	35	50	30.3	24.2	41	57	35

[b]Not specified.

Table 4. (Continued)

Curricular area	C. Southern Region											Median for region
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.	
Agricultural economics & rural sociology	9.9	9	11.3	6	9	16	7	13	2	6	6.6	9
Agricultural engineering	9.9	9	10	11	12	10	2	9	4	10	16.5	10
General animal science	6.7	6	3.3	12	11	0	6	6	2	8	4	6
Dairy science	3.3	0	0	4	3	0	3	3	4	5	0	3
Livestock enterprises	3.3	0	2	3	3	0	3	3	5.3	5	0	3
Crop science	3.3	3	0	7	9	0	3	3	2	6	3.3	3
Forestry	3.3	3	3.3	2	3	0	0	3	2	0	2	2
Horticulture	10	3	0	3	6	0	3	9	4	3	0	3
Soil science	3.3	4	3.3	8	7	4	4	6	2	8	2	4
Other, not specified	0	3	7.8	3	0	0	0	0	0.7	11	1.6	-
Total credits technical agriculture	53	40	41	59	63	30	31	55	28	62	36	41

Region. Great differences existed among the institutions in the regions. The University of Minnesota with 24 credits, and the University of Kentucky with 31 credits required were low. The A. and M. College of Texas with 62 credits, and the Mississippi State University with 63 credits required were high.

According to data in Table 4, the agricultural engineering area had the largest number of credits required in specific courses. A median of 8.5 semester credits in the North Atlantic Region and 12 credits in the Pacific Region was the range. The requirements in agricultural engineering courses varied among the institutions from 2 semester credits at the Oklahoma State University to 17 semester credits as high at the University of Nevada. The agricultural economics and rural sociology area was second high in the number of credits required in specific courses. A median of 6.3 semester credits in the Pacific Region to a median of 9 credits in the Southern Region was the range. There were wide variations in number of credits of agricultural economics and rural sociology required among the institutions. The credits ranged from a low of 0.7 semester credit at the Utah State University and the University of Connecticut to 15 credits at the University of Vermont.

In the general animal science area, the number of semester credits required in specific courses varied among the regions from a median of 3 credits in the North Atlantic

Region to a median of 6.6 credits in the Central Region. The number of credits required in general animal science courses varied greatly among the institutions from a low of "none" at the North Carolina State College to a high of 14 credits at the University of Wyoming.

As indicated by the data in Table 4, the number of semester credits in required specific courses in dairy science area varied greatly among the regions from a median of none in the Pacific Region to a median of 3.5 credits in the North Atlantic Region. Much greater differences existed among the institutions within the regions. The range was from none at 15 institutions to a high of 7 semester credits at Cornell University. The number of credits in required specific courses in the livestock enterprises varied among the regions from a median of zero in the Central and Pacific Regions to a median of 3 semester credits in the North Atlantic and Southern Regions. The range in number of required credits in specific courses in livestock enterprises varied greatly among the institutions from none at 15 institutions to 7.3 semester credits at the Colorado State University.

The number of credits in specific required courses in crop science varied slightly among the regions from a median of 3 semester credits in the Southern Region to a median of 4 credits in the Central and Pacific Regions. The number of credits in specific required courses in crop science varied

greatly among the institutions in the regions from none at five institutions to 14 semester credits at the University of Wyoming.

The credits in specific required courses in forestry varied greatly among the regions from a median of zero in the Central, North Atlantic, and Pacific Regions to a median of 2 semester credits in the Southern Region. The range of credits in forestry varied among the institutions from none at 31 institutions to 6 semester credits at the University of Vermont.

The number of credits in specific required courses in horticulture varied from a median of none in the Central and Pacific Regions to a median of 3 semester credits in the Southern Region. Wide variation existed among the institutions in the regions with no specific courses required at 18 institutions to 10 semester credits required at Auburn University and 9 required at Clemson College.

Data contained in Table 4 concerning the number of credits required in specific courses in soil science indicated that small differences existed among the regions. The range was from a median of 3 semester credits in the Pacific Region to 4 credits in the Central, North Atlantic, and Southern Regions. The number of credits in soil science varied greatly among the institutions of the regions from none in two institutions to 8 semester credits at the Louisiana State Univer-

sity and the A. and M. College of Texas.

Professional education areas An analysis of the number of credits required in specific courses in professional education, as presented in Table 5, indicates small differences existed among the regions. The median ranged from 21 credits in the Central and Southern Regions to 24 credits in the Pacific Region. There were considerably more credits required in specific courses in agricultural education, including student teaching, than credits in education and psychology. In the Central Region the median for agricultural education courses was 15 credits whereas the median for education and psychology was 6 credits. The range in number of credits in agricultural education among the institutions in the Central Region varied from 8 credits at Purdue University to 19 at the University of Missouri and the University of Nebraska and from none in education and psychology at the University of Kentucky and the Ohio State University to a high of 11 credits at the Iowa State University.

In the North Atlantic Region, the University of Connecticut was low with 7 to 9 credits required in agricultural education courses. A high of 25 credits was required at the University of New Hampshire. In required education and psychology courses the range was from none at two institutions to 15 credits at the University of Connecticut.

The University of California in the Pacific Region

Table 5. Distribution of semester credits in professional education curricular areas required of all agricultural education majors, by region and state

Region and state	Curricular area: Agricultural education courses[a]	Curricular area: Education and psychology courses	Total credits professional education
A. Central Region			
Illinois	14	3	17
Indiana	8	10	18
Iowa	14	11	25
Kansas	11	9	19
Kentucky	18	0	18
Michigan	12	8	20
Minnesota	18	3	21
Missouri	19	5	24
Nebraska	19	3	22
North Dakota	16	6	22
Ohio	15	0	15
South Dakota	16	6	22
Wisconsin	15	8	23
Median for region	15	6	21
B. North Atlantic Region			
Connecticut	7-9[b]	15[b]	22-24
Delaware	15	6	21
Maine	15	0	15
Maryland	20	6	26
New Hampshire	25	6	31
New York	12	3	15
Pennsylvania	19	6	25
Vermont	17	0	17
Median for region	16	6	22

[a]Includes credits in student teaching.

[b]Includes requirements for certification; students could and do meet graduation requirements with a minimum of 12 credits in professional education requirements.

Table 5. (Continued)

Region and state	Curricular area: Agricultural education courses	Curricular area: Education and psychology courses	Total credits professional education
C. Pacific Region			
Arizona	15	5	20
California	12	5	17
Colorado	22	4	26
Idaho	20	9	29
Montana	16	4	20
Nevada	13	11	24
New Mexico	22	6	28
Oregon	17	6	23
Utah	13	9	22
Washington	16	12	28
Wyoming	18	11	29
Median for region	16	6	24
D. Southern Region			
Alabama	21	17	38
Arkansas	15	3	18
Georgia	19	3	22
Louisiana	18	0	18
Mississippi	16	6	22
North Carolina	15	9	24
Oklahoma	18	3	21
South Carolina	15	3	18
Tennessee	16	6	22
Texas	15	3	18
Virginia	13	4	17
Median for region	16	3	21

required only 12 credits in agricultural education courses, whereas the University of New Mexico and the Colorado State University required 22 credits. In required education and psychology courses, the range in the Pacific Region was from

a low of 4 credits at the Montana State College to 12 credits at the Washington State University.

In the Southern Region the credits required in specific courses in agricultural education varied from 13 credits at the Virginia Polytechnic Institute to 21 credits at Auburn University. The credits in required education and psychology courses varied greatly from none at the Louisiana State University to 17 credits at Auburn University.

Specific courses and credits required of all agricultural education majors in each curricular area

The total credits in required courses in each curricular area were indicated in Tables 3 through 5 and were discussed previously. The distribution of the credits and the specific courses required in each curricular area are presented in Tables 6 through 23.

Specific courses required in agricultural economics and rural sociology The specific courses and credits required in agricultural economics and rural sociology are presented in Table 6.

In the Central Region all institutions except four required courses in farm management and organization. These courses varied in credits from 2 to 3.3 semester credits. Only the Iowa State University required a specific course in farm accounting and business analysis. None of the institutions in the region required a specific course in agricultural

Table 6. Semester credits in specific courses in agricultural economics and rural sociology required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Agricultural Cooperatives	-	-	-	-	-	-	-	-	-	-	-	-	3
Agricultural Finance	-	-	-	-	-	-	-	-	-	-	-	-	-
Agricultural Marketing	3	-	-	-	3	-	-	-	3	-	-	-	-
Agricultural Policy	-	-	-	-	-	-	-	-	-	-	-	-	-
Crop and Livestock Statistics	-	-	-	-	-	-	-	-	-	-	-	-	-
Principles of Economics	-	-	-	-	-	2	-	-	-	3.3	-	-	3
Elements of Dairy Economics	-	-	-	-	-	-	-	-	-	-	-	-	-
Farm Accounting and Business Analysis	-	-	2	-	-	-	-	-	-	-	-	-	-
Farm Management and Organization	-	3	2.6	-	3	3.3	-	3	3	-	3.3	2	3
Introduction to Agricultural Economics	3	3	6	3	-	3.3	4	5	-	2	3.3	-	-
Marketing Livestock and Meat	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Sociology	-	-	-	-	-	-	-	-	-	-	-	2	-
Survey of Agriculture	-	-	R[a]	2	2	-	-	3	-	0.6	0.6	2	2
Total credits	6	6	10.6	5	8	8.6	4	11	6	5.9	7.2	6	11

[a]Required, no credit given.

Table 6. (Continued)

Course area	B. North Atlantic Region						
	Conn.[b]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Agricultural Cooperatives		-	-	-	3	-	-	-
Agricultural Finance		-	3	-	-	-	-	-
Agricultural Marketing		-	3	-	-	-	-	-
Agricultural Policy		-	-	-	-	-	-	-
Crop and Livestock Statistics		-	-	-	-	-	-	-
Elements of Dairy Economics		-	-	-	-	-	-	-
Farm Accounting and Business Analysis		3	-	-	-	-	3	-
Farm Management and Organization		3	4	3	4	5	-	3
Farm Products		-	-	-	-	-	-	3
Introduction to Agricultural Economics		-	3	-	-	-	-	-
Marketing Livestock and Meat		-	-	-	-	-	-	-
Principles of Economics		-	-	-	-	-	-	6
Rural Sociology		3	-	-	-	-	-	3
Survey of Agriculture		-	R[a]	-	1	-	-	-
Total credits		9	13	3	8	5	3	15

[b]No specifications were reported.

Table 6. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.[c]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Agricultural Cooperatives	-		-	-	-	-	-	-	-	3	-
Agricultural Finance	-		-	-	-	-	3	-	-	-	2
Agricultural Marketing	-		-	3	-	-	3	-	-	3	3
Agricultural Policy	-		-	-	-	-	-	-	-	-	-
Crop and Livestock Statistics	-		-	-	-	-	-	-	-	-	-
Elements of Dairy Economics	-		-	-	-	-	-	-	-	-	-
Farm Accounting and Business Analysis	-		2	-	-	-	3	-	-	-	2
Farm Management and Organization	-		3.3	-	2.7	3	3	3.3	-	-	3
Introduction to Agricultural Economics	3		2	3	3.3	3	-	2	-	-	-
Rural Sociology	-		-	-	-	-	-	-	-	-	-
Survey of Agriculture	-		2	1	0.3	1	-	-	0.6	-	-
Vocations in Agriculture	1		-	-	-	-	-	-	-	-	-
Not specified in Technical Agriculture		18									
Total credits	4	18	9.3	7	6.3	7	12	5.3	0.6	6	10

[c]Not specified, see Table 7 for total credits in technical agriculture.

Table 6. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Agricultural Cooperatives	-	-	-	-	-	-	-	-	-	-	-
Agricultural Finance	-	-	-	-	-	-	-	-	-	-	-
Agricultural Marketing	-	3	3.3	-	-	3	3	-	-	3	-
Agricultural Policy	-	-	-	-	-	-	-	3	-	-	-
Crop and Livestock Statistics	-	-	-	-	-	-	-	-	-	-	-
Economics of Agriculture	-	-	-	-	-	-	-	-	-	-	2
Elements of Dairy Economics	-	-	-	-	-	-	-	-	-	-	-
Farm Accounting and Business Analysis	-	-	-	3	-	-	-	-	-	-	-
Farm Management and Organization	3.3	3	3.3	3	6	3	3	3	-	3	3.3
Introduction to Agricultural Economics	3.3	3	4	-	3	3	-	3	2	-	-
Marketing Livestock and Meat	-	-	-	-	-	-	-	-	-	-	-
Rural Sociology	3.3	-	-	-	-	6	-	3	-	-	-
Survey of Agriculture	-	-	0.6	-	-	1	1	1	-	-	1.3
Total credits	9.9	9	11.2	6	9	16	7	13	2	6	6.6

finance. A specific course in agricultural marketing was required by only three institutions. Introduction to agricultural economics courses were required by all but three of the institutions in the region. Only the University of Wisconsin required a course in agricultural cooperatives. The South Dakota State College was the only institution that required a course in rural sociology.

In the North Atlantic Region a farm management and organization course was required by all institutions except the Pennsylvania State University. Only the University of New Hampshire required a specific course in agricultural cooperatives. Agricultural marketing and finance courses were not required by any institution except the University of Maine. An introduction to agricultural economics course was required only by the University of Maine. A rural sociology course was required only by the University of Delaware.

Only five institutions in the Pacific Region required specific courses in farm management and organization. Introduction to agricultural economics courses were required by six institutions. Only the Washington State University required a course in agricultural cooperatives. Agricultural finance courses were required only by the New Mexico State University and by the University of Wyoming. An agricultural marketing course was required by four institutions. None of

the institutions in the region required any specific course in rural sociology.

In the Southern Region none of the institutions required specific courses in agricultural cooperatives and agricultural finance. There were only five institutions that required specific courses in agricultural marketing. Farm management and organization courses were required by all institutions except the University of Tennessee. The Virginia Polytechnic Institute was the only institution in the region that required a course in economics of agriculture. Four institutions did not require any specific course relating to an introduction to agricultural economics. Three institutions required a specific course in rural sociology. They were Clemson College, North Carolina State College and Auburn University.

Specific courses required in agricultural engineering

The specific courses and credits required in agricultural engineering are presented in Table 7.

In the Central Region none of the institutions required specific work in carpentry. The Iowa State University and the Michigan State University were the only institutions which required construction methods and materials courses. These courses were for 2 and 2.6 semester credits respectively. Only two institutions required specific courses in engineering problems applied to agriculture. Farm buildings and structure courses were required by three institutions. Eight

Table 7. Semester credits in specific courses in agricultural engineering required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Agricultural Construction Materials and Procedures	-	-	2	2	-	-	-	-	-	-	-	-	-
Carpentry	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Methods and Materials	-	-	2	-	-	2.6	-	-	-	-	-	2	-
Elements of Physics	-	-	-	-	-	-	3.3	-	-	-	-	-	-
Engineering Principles Applied to Agriculture	-	-	-	-	-	2.6	-	-	-	-	-	-	3
Engineering Problems in Livestock Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Farm Buildings and Structures	1.5	-	-	3	-	-	-	-	-	3.3	-	-	-
Farm Electricity	-	-	-	-	-	-	-	-	-	-	-	2	-
Farm Machinery	1.5	-	2.6	3	-	3.3	-	-	3	2	3.3	2	-
Farm Mechanics, Basic	3	3	-	2	-	3.3	-	-	-	2.6	3.3	-	-
Farm Shop	-	-	-	-	-	-	-	3	-	-	-	-	-
Farm Water Supply, Sanitation	1.5	-	-	-	-	-	-	-	-	-	-	-	-
Irrigation	-	-	-	-	-	-	-	-	-	-	-	-	-
Mechanical Drawing	-	-	1.3	-	-	-	-	-	-	-	-	-	-
Metal Construction and Maintenance	-	-	-	-	-	-	2.6	-	2	-	-	-	-

Table 7. (Continued)

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Methods of Teaching Agricultural Mechanics[a]	-	3	2	3	-	-	2	3	2	-	-	2	-
Soil and Water Management	1.5	-	-	-	-	-	-	-	-	-	-	-	-
Tractor Power	-	-	-	3	-	-	-	3	-	3.3	3.3	-	-
Welding	-	-	-	-	-	-	-	-	-	1.3	-	-	2
Total credits	9	6	9.9	16	9[b]	11.8	7.9	9	7	12.5	9.9	8	5

Course area	B. North Atlantic Region						
	Conn.[c]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Agricultural Construction Materials and Procedures		-	-	-	-	-	-	-
Carpentry		-	-	-	-	-	-	3
Construction Methods and Materials		-	-	-	-	-	-	-
Engineering Problems in Livestock Production		-	-	-	-	-	-	-
Farm Buildings and Structures		-	-	-	-	-	-	-

[a]See also Table 22.

[b]Not specified.

[c]No specifications were reported.

Table 7. (Continued)

Course area	B. North Atlantic Region							
	Conn.[c]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Farm Electricity		-	-	-	-	-	3	-
Farm Machinery		3	-	3	3	3	-	-
Farm Mechanics, Basic	-	-	-	2	4	3	3	-
Farm Power, Machinery and Electricity		-	-	-	-	-	-	3
Farm Shop		3	5	-	-	-	-	3
Farm Structures and Utilities		-	-	-	-	-	-	3
Farm Water Supply, Sanitation		-	-	-	-	-	-	-
Irrigation		-	-	-	-	-	-	-
Mechanical Drawing		-	-	-	-	-	-	-
Metal Construction and Maintenance		-	-	-	-	2	-	-
Methods of Teaching Agricultural Mechanics[a]		-	-	-	-	-	-	-
Soil and Water Management		-	-	-	-	-	-	-
Tractor Power		3	-	3	-	3	3	-
Other in the area		-	6	-	-	-	-	-
Total credits		9	11	8	7	11	9	12

Table 7. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.[d]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Agricultural Construction Materials and Procedures	-		-	-	-	10	-	-	-	-	-
Agricultural Surveying	-		-	-	-	-	2	-	-	-	-
Carpentry	-		-	-	-	-	-	-	-	3	-
Construction Methods and Materials	-		-	-	-	-	-	-	-	-	-
Engineering Problems in Livestock Production	-		-	-	-	-	-	-	-	-	-
Farm Buildings and Structures	-		2	3	-	-	-	2	3.3	-	2
Farm Electricity	-		-	-	-	-	-	-	-	-	2
Farm Machinery	-		2	3	2	-	3	2	3.3	-	4
Farm Mechanics, Basic	3		2	3	6	-	-	2	3.3	3	-
Farm Shop	-		-	-	-	-	4	-	-	-	-
Farm Water Supply, Sanitation	-		-	-	-	-	-	-	-	-	-
Irrigation	4		-	-	2	3	3	-	3.3	-	-
Mechanical Drawing	-		1.3	-	-	-	-	-	-	-	-
Metal Construction and Maintenance	-		-	-	-	-	-	-	-	-	-

[d]Not specified, see Table 6 for total credits in technical agriculture.

Table 7. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.[d]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Methods of Teaching Agricultural Mechanics[a]	2		2	3	-	2	-	2	-	-	2
Soil and Water Management	-		-	-	-	-	-	-	-	-	-
Tractor Power	3		2	-	2	2	-	-	2.8	-	-
Total credits	12		11.3	12	12	17	12	8	16	6	10

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.D.	Okla.	S.C.	Tenn.	Texas	Va.
Agricultural Construction Materials and Procedures	-	-	-	-	3	4	-	-	-	-	-
Carpentry	-	-	-	-	-	-	-	-	-	-	-
Construction Methods and Materials	-	-	-	-	-	-	-	-	-	-	-
Engineering Problems in Livestock Production	-	-	-	-	-	-	-	-	-	-	-
Farm Buildings and Structures	3.3	-	-	-	3	-	-	-	-	2	1.3
Farm Electricity	-	-	-	3	-	-	-	-	-	3	2
Farm Machinery	3.3	-	-	3	3	3	-	3	-	-	3.3
Farm Mechanics, Basic	3.3	6	-	3	-	-	2	3	2	2	-

Table 7. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.D.	Okla.	S.C.	Tenn.	Texas	Va.
Farm Shop	-	-	10	-	-	-	-	-	-	-	9.3
Farm Water Supply, Sanitation	-	-	-	-	-	-	-	-	-	-	-
Irrigation	-	-	-	-	-	-	-	-	-	-	-
Mechanical Drawing	-	-	-	-	-	-	-	-	-	-	0.6
Metal Construction and Maintenance	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching Agricultural Mechanics[a]	-	3	-	-	-	3	-	-	-	-	-
Principles of Agricultural Engineering	-	-	-	-	-	-	-	-	2	-	-
Soil and Water Management	-	-	-	-	-	-	-	3	-	3	-
Tractor Power	-	-	-	2	3	-	-	-	-	-	-
Total credits	9.9	9	10	11	12	10	2	9	4	10	16.5

institutions required specific courses in farm machinery. A mechanical drawing course was required only by the Iowa State University. Basic farm mechanics courses were required by six institutions. Only the University of Missouri required a specific course in farm shop. Methods of teaching farm mechanics courses were required by seven institutions. Only the University of Illinois required a course in soil and water management. A farm electricity course was required only by the South Dakota State College.

In the North Atlantic Region none of the institutions required specific courses in soil and water management, agricultural construction materials and procedures, construction methods and materials, farm buildings and structures, mechanical drawing, irrigation and methods of teaching agricultural mechanics.* Only the University of Vermont required a specific course in carpentry. A farm electricity course was required only by the Pennsylvania State University. Four institutions required farm machinery courses. Specific courses in basic farm mechanics were required by four institutions. Only the University of Vermont required a farm power, machinery and electricity course. Only three institutions required specific courses in farm shop.

In the Pacific Region none of the institutions required

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*See also methods of teaching farm mechanics in Table 22.

specific courses in soil and water management, and construction methods and materials. The University of Nevada required 10 semester credits in agricultural construction materials and procedures. A carpentry course was required only by the Washington State University. Only the New Mexico State University required a specific course in agricultural surveying and a specific course in farm shop. Basic farm mechanics courses were required by seven institutions. Only the University of Wyoming required a farm electricity course. Irrigation courses were required by five institutions. They carried from 2 to 4 semester credits. Only the University of Colorado required a specific course in mechanical drawing. Methods of teaching farm mechanics courses were required by six institutions. Five institutions required tractor power courses. All were 2 to 3 semester credits courses.

In the Southern Region no states required specific courses in carpentry, construction methods and materials, and irrigation. Only the Mississippi State University and the North Carolina State College required courses in agricultural construction materials and procedures. A mechanical drawing course for 0.6 semester credits was required only by the Virginia Polytechnic Institute. The University of Tennessee was the only institution which required a specific course in principles of agricultural engineering. Soil and water management courses were required by only two institutions. The

University of Arkansas and the North Carolina State College required specific courses related to methods of tea hing farm mechanics. Farm electricity courses were required by only three institutions. Six institutions required farm machinery courses. All carried 3 to 3.3 semester credits. Basic farm mechanics courses were required by six institutions. Only four institutions required specific courses in farm buildings and structures.

The fact that specific courses were not required does not necessarily mean that agricultural education majors did not receive instruction in the subject matter areas concerned. Courses were organized in some institutions to provide instruction relating to several specific subject matter fields. In some institutions students elected courses in specific fields of agricultural engineering to meet his individual needs.

Specific courses required in general animal science

The specific courses and credits required in general animal science are presented in Table 8.

In the Central Region all institutions except the University of Illinois, the University of Minnesota, and the Ohio State University required specific courses in animal nutrition. These courses carried from 2 to 4 semester credits. None of the institutions in this region required specific courses in advanced animal nutrition, breeds of livestock,

Table 8. Semester credits in specific courses in general animal science required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Animal Nutrition	-	3	2	4	4	3.3	-	3	3	3.3	-	2.6	4
Advanced Animal Nutrition	-	-	-	-	-	-	-	-	-	-	-	-	-
Anatomy and Physiology of Animals	-	-	-	-	-	-	-	-	-	-	-	3.3	-
Animal Sanitation and Disease Control	-	3	-	-	-	-	-	-	-	-	-	-	-
Breeds of Livestock	-	-	-	-	-	-	-	-	-	-	-	-	-
Introduction to Animal Science	3	-	-	-	-	-	-	-	-	-	-	-	-
Livestock Production	-	-	3.3	-	-	-	-	-	3	2	3.3	2.6	3
Livestock Feeding	3	-	-	-	-	-	-	-	3	-	-	2.6	-
Livestock Feeding and Management	-	-	-	-	-	-	-	-	-	-	3.3	-	-
Livestock Selection and Judging	-	-	-	-	-	-	2.6	-	-	-	-	-	-
Livestock Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-
Orientation	-	3	-	-	-	-	-	-	-	-	-	-	-
Principles of Breeding	-	-	-	-	-	3.3	-	3	-	-	-	-	-
Veterinary Science	-	-	-	-	3	-	-	-	-	-	-	-	-
Total credits	6	9	5.3	4	7	6.6	2.6	6	9	5.3	6.6	11.1	7

Table 8. (Continued)

Course area	B. North Atlantic Region						
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Animal Nutrition		-	-	-	3	4	3	-
Advanced Animal Nutrition		-	-	-	-	-	-	-
Anatomy and Physiology of Animals		-	-	-	-	-	-	-
Animal Sanitation and Disease Control		-	-	-	-	-	-	-
Breeds of Livestock		-	-	-	-	-	-	-
Feeds and Feeding		-	-	3	-	-	-	3
Fundamentals of Animal Husbandry		-	-	3	-	-	-	-
Livestock Production		3	-	-	-	-	3	-
Livestock Feeding		-	3	-	-	-	3	-
Livestock Feeding and Management		-	-	-	-	-	-	-
Livestock Selection and Judging		-	-	-	-	-	-	-
Livestock Marketing		-	-	-	-	-	-	-
Principles of Breeding		-	-	-	-	3	-	-
Veterinary Science		-	-	-	-	-	-	-
Total credits		3	3	6	3	7	9	3

[a]No specifications were reported.

Table 8. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Animal Nutrition	3		-	-	2.6	3	-	2	3.3	3	-
Animal Science	-		-	-	3.3	-	-	-	-	-	-
Advanced Animal Nutrition	-		3.3	-	-	-	-	-	-	-	-
Anatomy and Physiology of Animals	-		-	-	2.6	-	-	-	-	-	-
Animal Sanitation and Disease Control	3		2.6	-	-	-	-	-	-	-	-
Breeds of Livestock	-		-	-	-	-	-	-	-	-	3
Introduction to Animal Husbandry	-		-	-	-	-	3	-	-	-	-
Livestock Feeding	-		-	3	-	-	4	2	-	3	3
Livestock Feeding and Management	-		-	-	-	-	-	-	-	-	-
Livestock Marketing	-		-	-	-	-	-	-	-	-	3
Livestock Production	-		-	-	-	-	-	-	-	3	3
Livestock Selection and Judging	-		1.3	-	-	-	-	-	-	-	2
Principles of Breeding	-		1.3	3	-	-	-	-	-	-	-
Veterinary Science	-		-	-	2	-	-	-	-	-	-
Total credits	6		8.5	6	10.6	3	7	4	3.3	9	14

[b]Not specified; see total credits for technical agriculture in Table 6.

Table 8. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Animal Nutrition	-	-	3.3	3	-	-	3	3	2	3	-
Advanced Animal Nutrition	-	-	-	-	-	-	-	-	-	-	-
Anatomy and Physiology of Animals	-	-	-	-	-	-	-	-	-	-	-
Animal Sanitation and Disease Control	-	-	-	-	-	-	-	-	-	-	-
Breeds of Livestock	-	-	-	3	3	-	-	-	-	3	-
Diseases of Domestic Animals	-	-	-	-	-	-	-	-	-	-	2
Livestock Feeding	3.3	-	-	-	3	-	-	-	-	-	-
Livestock Feeding and Management	-	-	-	-	-	-	-	-	-	2	2
Livestock Marketing	-	-	-	-	-	-	-	-	-	-	-
Livestock Production	3.4	3	-	2	3	-	-	-	-	-	-
Livestock Selection and Judging	-	-	-	-	-	-	3	3	-	-	-
Principles of Breeding	-	-	-	-	-	-	-	-	-	-	-
Veterinary Science	-	3	-	4	2	-	-	-	-	-	-
Total credits	6.7	6	3.3	12	11	0	6	6	2	8	4

and livestock marketing. The Purdue University was the only institution that required a specific course in animal sanitation and disease control. Only the University of Illinois required a specific introductory course to animal science. Livestock production courses were required by six institutions. Three institutions required specific courses in livestock feeding. Only the University of Minnesota required a specific course in livestock selection and judging. Only the University of Kentucky required a specific course in veterinary science and only the Ohio State University required a specific course in livestock feeding and management.

In the North Atlantic Region none of the institutions required courses in advanced animal nutrition, animal sanitation and disease control, breeds of livestock, livestock feeding and management, livestock selection and judging, livestock marketing, and veterinary science. Only three institutions required specific courses in animal nutrition. The University of Delaware and the Pennsylvania State University were the only institutions which required specific courses in livestock production. Livestock feeding, and feeds and feeding courses were required by only two institutions. The Cornell University was the only institution that required a course in principles of breeding. A fundamentals of animal husbandry course for 3 semester credits was required by the University of Maryland.

In the Pacific Region none of the institutions required specific courses in livestock feeding and management. Animal nutrition courses were required by eight institutions. The courses carried from 2 to 3.3 semester credits. Animal science, advanced animal nutrition, breeds of livestock, livestock marketing, veterinary science, and introduction to animal husbandry courses were required by only one institution. Four institutions required specific courses ranging from 2 to 4 semester credits in livestock feeding. The Colorado State University and the University of Wyoming were the only institutions that required specific courses in livestock selection and judging. Only two institutions required specific courses in principles of breeding.

In the Southern Region six institutions required animal nutrition courses. The courses were for 2 to 3.3 semester credits. Livestock production courses were required by four institutions. None of the institutions required specific courses in advanced animal nutrition, animal sanitation and disease control, anatomy and physiology of animals, and principles of breeding. Three institutions required 3 semester credit courses in breeds of livestock. Only the Virginia Polytechnic Institute required a specific course in diseases of domestic animals. Two of the institutions in the region required courses in livestock feeding and management, and in livestock selection and judging. Veterinary science courses

were required by three institutions. The courses carried from 2 to 4 semester credits.

While specific courses were not required, it is possible that agricultural education majors in all institutions may have received instruction in all of the subject matter areas. Several areas may be included in one course. The institutions varied also in number of elective courses and credits available to the student.

Specific courses required in dairy science The credits and specific courses in dairy science required of all agricultural education majors are presented in Table 9.

In the Central Region only the Ohio State University required a specific course in dairy cattle production and management. Only the University of Wisconsin required a specific course in dairy and food industry. Elements of dairying courses were required by five institutions. None of the institutions required specific courses in dairy cattle breeds, dairy farm problems, dairy cattle judging, dairy sanitation, feeding dairy cattle, or in milk production. Six institutions in the Central Region did not require specific courses in the dairy science area.

In the North Atlantic Region none of the institutions required specific courses in dairy cattle breeds, dairy farm problems, dairy sanitation, or in feeding dairy cattle. Only the University of Vermont and Cornell University required

Table 9. Semester credits in specific courses in dairy science required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Dairy Cattle Breeds	-	-	-	-	-	-	-	-	-	-	-	-	-
Dairy Cattle Production and Management	-	-	-	-	-	-	-	-	-	-	3.3	-	-
Dairy Farm Problems	-	-	-	-	-	-	-	-	-	-	-	-	-
Dairy Cattle Judging	-	-	-	-	-	-	-	-	-	-	-	-	-
Dairy and Food Industry	-	-	-	-	-	-	-	-	-	-	-	-	3
Dairy Sanitation	-	-	-	-	-	-	-	-	-	-	-	-	-
Elements of Dairying	3	-	-	-	-	-	2	-	3	2	-	2.6	-
Feeding Dairy Cattle	-	-	-	-	-	-	-	-	-	-	-	-	-
Milk Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	3	0	0	0	0	0	2	0	3	2	3.3	2.6	3

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Dairy Cattle Breeds		-	-	-	-	-	-	-
Dairy Cattle and Milk Production		-	-	-	-	4	-	3
Dairy Farm Problems	-	-	-	-	-	-	-	-
Dairy Cattle Judging		1	-	-	-	-	-	-

[a]No specifications were reported.

Table 9. (Continued)

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Dairy Sanitation		-	-	-	-	-	-	-
Dairy Science		-	3	-	-	3	-	-
Elements of Dairying		3	-	3	3	-	3	-
Feeding Dairy Cattle		-	-	-	-	-	-	-
General Dairying		-	3	-	-	-	-	3
Total credits		4	6	3	3	7	3	6

Course area	C. Pacific Region										
	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Dairy Cattle Breeds	-		-	-	-	-	-	-	-	-	-
Dairy Cattle and Milk Production	-		-	-	-	-	-	-	-	-	-
Dairy Cattle Judging	-		-	-	-	-	-	-	-	-	-
Dairy Farm Problems	-		-	-	-	-	-	-	-	3	-
Dairy Sanitation	-		-	-	-	-	-	-	-	-	-
Elements of Dairying	-		2	-	-	-	4	-	-	-	3
Feeding Dairy Cattle	-		-	-	-	-	-	-	-	-	-
Milk Production	-		-	-	-	-	-	-	-	-	-
Total credits	0		2	0	0	0	4	0	0	3	3

[b]Not specified; see Table 6 for total credits in technical agriculture.

Table 9. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Dairy Cattle Breeds	-	-	-	-	-	-	-	-	-	-	-
Dairy Cattle Judging	-	-	-	1	-	-	-	-	-	-	-
Dairy Farm Problems	-	-	-	-	-	-	-	-	-	-	-
Dairy Management	-	-	-	-	-	-	-	-	-	2	-
Dairy Sanitation	-	-	-	-	-	-	-	-	-	-	-
Elements of Dairying	3.3	-	-	3	3	-	3	3	2	3	-
Feeding Dairy Cattle	-	-	-	-	-	-	-	-	-	-	-
Milk Processing	-	-	-	-	-	-	-	-	2	-	-
Milk Production	-	-	-	-	-	-	-	-	-	-	-
Total credits	3.3	0	0	4	3	0	3	3	4	5	0

dairy cattle and milk production courses for 3 and 4 semester credits respectively. Elements of dairying courses for 3 semester credits were required by four institutions. Only the University of Delaware required a specific course in dairy cattle judging. Two institutions required courses in general dairying and dairy science.

In the Pacific Region none of the courses in the dairy science area were required except the dairy farm problems course required by the Washington State University and the elements of dairying course required by three institutions, Colorado, New Mexico and Wyoming. Seven institutions did not require any specific courses in dairy science.

In the Southern Region only the Louisiana State University required a specific course in dairy cattle judging. The Texas A. and M. College was the only institution that required a course in dairy management. Only the University of Tennessee required a course in milk processing. Seven institutions required courses related to elements of dairying. These courses carried from 2 to 3.3 semester credits. Four institutions in the Southern Region did not require any specific courses in the dairy science area. It is possible that units in dairy science may have been included in other required courses, or that students may elect dairy science courses to meet individual needs.

Specific courses required in livestock enterprises

Data in Table 10 indicate the credits and specific courses required related to specific livestock enterprises.

In the Central Region only five of the institutions required specific courses in livestock enterprises. The Iowa State University, the North Dakota Agricultural College, the Ohio State University, the South Dakota State College and the University of Wisconsin required poultry production and management courses. Eight institutions did not require specific Courses related to individual livestock enterprises.

In the North Atlantic Region seven institutions required courses in poultry production and management. All were for 3 semester credits. No other specific courses dealing with individual enterprises were required by any institution in the region.

In the Pacific Region poultry production and management courses were required by four institutions. They carried from 2 to 3 semester credits. A beef cattle production and marketing course was required by only the Colorado State University. A broiler production course for 3.3 semester credits and a sheep and/or goat production and marketing course for 2 credits were required by the Colorado State University. Five institutions did not require any specific courses related to individual livestock enterprises.

In the Southern Region three institutions did not require

Table 10. Semester credits in specific courses in livestock enterprises required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Beef Cattle Production and Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-
Broiler Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Egg Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Horses and/or Mules	-	-	-	-	-	-	-	-	-	-	-	-	-
Poultry Production and Management	-	-	2	-	-	-	-	-	-	2	3.3	2	3
Sheep and/or Goat Production and Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-
Swine Production and Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	0	0	2	0	0	0	0	0	0	2	3.3	2	3

Course area	B. North Atlantic Region						
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Beef Cattle Production and Marketing		-	-	-	-	-	-	-
Broiler Production		-	-	-	-	-	-	-
Egg Production		-	-	-	-	-	-	-
Horses and/or Mules		-	-	-	-	-	-	-
Poultry Production and Management		3	3	3	3	3	3	3

[a]No specifications were reported.

Table 10. (Continued)

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Sheep and/or Goat Production and Marketing		-	-	-	-	-	-	-
Swine Production and Marketing		-	-	-	-	-	-	-
Turkey Production		-	-	-	-	-	-	-
Total credits		3	3	3	3	3	3	3

Course area	C. Pacific Region									
	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Beef Cattle Production and Marketing	-		2	-	-	-	-	-	-	-	-
Broiler Production	-		3.3	-	-	-	-	-	-	-	-
Egg Production	-		-	-	-	-	-	-	-	-	-
Horses and/or Mules	-		-	-	-	-	-	-	-	-	-
Poultry Production and Management	-		-	-	-	-	3	2	-	3	3
Sheep and/or Goat Production and Marketing	-		2	-	-	-	-	-	-	-	-
Swine Production and Marketing	-		-	-	-	-	-	-	-	-	-
Turkey Production	-		-	-	-	-	-	-	-	-	-
Total credits	0		7.3	0	0	0	3	2	0	3	3

[b]Not specified; see Table 6 for total credits in technical agriculture.

Table 10. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Beef Cattle Production and Marketing	-	-	-	-	-	-	-	-	-	-	-
Broiler Production	-	-	-	-	-	-	-	-	-	-	-
Egg Production	-	-	-	-	-	-	-	-	-	-	-
Horses and/or Mules	-	-	-	-	-	-	-	-	-	-	-
Marketing Classes	-	-	-	-	-	-	-	-	3.3	-	-
Poultry Production and Management	3.3	-	2	3	3	-	3	-	2	5	-
Poultry Science	-	-	-	-	-	-	-	3	-	-	-
Sheep and/or Goat Production and Marketing	-	-	-	-	-	-	-	-	-	-	-
Swine Production and Marketing	-	-	-	-	-	-	-	-	-	-	-
Turkey Production	-	-	-	-	-	-	-	-	-	-	-
Total credits	3.3	0	2	3	3	0	3	3	5.3	5	0

any specific courses related to individual livestock enterprises. Poultry production and management courses were required by all but three institutions. The University of Tennessee was the only institution that required a market classes course. It carried 3.3 semester credits. A poultry science course was required by the North Carolina State College.

It appeared that with the exception of the poultry enterprise, the other animal enterprises were included in the organization of general livestock production and nutrition courses.

Specific courses required in crop science The specific courses and credits required of all agricultural education majors in crop science are shown in Table 11.

In the Central Region all of the institutions except the Kansas State University, the University of Kentucky, and the Michigan State University required a specific course in crop production. Only two institutions required specific courses in crop insects and diseases. Forage crops courses were required by four institutions. They were 2 or 3 semester credit courses. The Michigan State University was the only institution that required a course in soils and plant nutrition. Only three institutions required a course dealing with principles of crop breeding. The University of Kentucky was the only institution that required no specific courses in the crop

Table 11. Semester credits in specific courses in crop science required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Crop Insects and Diseases	-	4	-	-	-	-	-	-	-	-	-	2	-
Crop Production	4	3	2	-	-	-	2.6	3	3	2	2.6	3.3	3
Forage Crops	-	-	2.6	-	-	-	-	-	3	2	-	2	-
Principles of Crop Breeding	-	3	-	4	-	-	2	-	-	-	-	-	-
Seed Analysis	-	-	-	-	-	-	-	-	-	-	-	-	-
Small Grain Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Soils and Plant Nutrition	-	-	-	-	-	3.3	-	-	-	-	-	-	-
Sugar and Fiber Crops	-	-	-	-	-	-	-	-	-	-	-	-	-
Tobacco Production	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	4	10	4.6	4	0	3.3	4.6	3	6	4	2.6	7.3	3

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Agronomy		-	-	3	-	-	-	-
Crop Insects and Diseases		3	-	4	-	-	-	-
Crop Production		3	-	-	-	4	4	-
Forage Crops		-	-	-	3	-	-	-
General Farm Crops		-	-	-	-	-	-	3
Introduction to Agriculture		-	-	1	-	-	-	-

[a]No specifications were reported.

Table 11. (Continued)

Course area	B. North Atlantic Region						
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Principles of Crop Breeding		-	-	-	-	-	-	-
Seed Analysis		-	-	-	-	-	-	-
Small Grain Production		-	-	-	-	-	-	-
Sugar and Fiber Crops		-	-	-	-	-	-	-
Tobacco Production		-	-	-	-	-	-	-
Total credits		6	0	8	3	4	4	3

Course area	C. Pacific Region										
	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Cotton and Other Fiber Crops	2		-	-	-	-	-	-	-	-	-
Crop Insects and Diseases	-		-	-	-	-	-	-	-	-	2
Crop Production	-		4	3	-	1	4	2	-	-	2
Forage Crops	3		-	-	-	3	-	2	-	3	3
Plant Science	-		-	-	3.3	-	-	-	-	-	-
Principles of Crop Breeding	-		-	-	-	-	-	-	-	-	-
Range Management	-		-	-	3.3	-	-	1	-	-	-
Seed Analysis	-		-	-	-	-	-	-	-	-	2
Small Grain Production	3		-	-	-	-	-	-	-	-	3

[b]Not specified; see Table 6 for total credits in technical agriculture.

Table 11. (Continued)

Course area	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Sugar and Fiber Crops	-		-	-	-	-	-	-	-	-	-
Tobacco Production	-		-	-	-	-	-	-	-	-	-
Weed Control	-		-	-	-	-	-	-	-	-	2
Total credits	8		4	3	6.6	4	4	5	0	3	14

D. Southern Region

Course area	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Crop Insects and Diseases	-	-	-	-	-	-	-	-	-	-	-
Crop Production	-	3	-	3	3	-	3	3	2	3	-
Forage Crops	3.3	-	-	4	3	-	-	-	-	3	-
Principles of Crop Breeding	-	-	-	-	-	-	-	-	-	-	-
Seed Analysis	-	-	-	-	-	-	-	-	-	-	-
Small Grain Production	-	-	-	-	-	-	-	-	-	-	-
Soil and Crop Management	-	-	-	-	-	-	-	-	-	-	3.3
Sugar and Fiber Crops	-	-	-	-	-	-	-	-	-	-	-
Tobacco Production	-	-	-	-	-	-	-	-	-	-	-
Other in the area	-	-	-	-	3	-	-	-	-	-	-
Total credits	3.3	3	0	7	9	0	3	3	2	6	3.3

science area.

The University of Maine was the only state in the North Atlantic Region that did not require any specific course in crop science. The University of Maryland was the only state that required an introduction to agriculture and crop insects and diseases courses. The University of Vermont was the only institution that required a course in general farm crops. A forage crops course was required only by the University of New Hampshire. Three institutions required a 3 to 4 semester credit course in crop production.

In the Pacific Region the Utah State University did not require any specific course or courses in crop science. The University of Arizona was the only state that required a specific course in cotton and other fiber crops. All the institutions in the region required a crop production course. Five institutions required courses in forage crops. The University of Wyoming was the only institution that required a course in weed control. A plant science course was required by only one institution. Two institutions required range management courses. Small grain production courses, each for 3 semester credits, were required by two institutions.

The North Carolina State College and the University of Georgia were the only institutions that required no specific courses in the crop science area. All but three institutions required a specific course in crop production. Only four

institutions required forage crops courses. These courses carried from 2 to 3 semester credits. The Virginia Polytechnic Institute was the only institution that required a 3.3 semester credit course in soil and crop management.

Specific courses required in forestry The credits and specific courses required in forestry are presented in Table 12.

No institution in the Central Region required any specific course in forestry. The Purdue University required a 3 semester credit course in conservation education.

Two institutions in the North Atlantic Region required courses in forestry. The Pennsylvania State University required a 3 semester credit course in farm forestry and courses in woodland management carrying 6 semester credits were required by the University of Vermont. No specific courses in forestry were required by any institution.

All but three institutions in the Southern Region required farm forestry courses. The courses carried from 2 to 3.3 semester credits. North Carolina State College, the Oklahoma State University and the Texas A. and M. College were the states that did not require any specific courses in the forestry area.

Specific courses required in horticulture The specific courses and credits required in horticulture are presented in Table 13.

Table 12. Semester credits in specific courses in forestry required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Conservation Education	-	3	-	-	-	-	-	-	-	-	-	-	-
Farm Forestry	-	-	-	-	-	-	-	-	-	-	-	-	-
Forest Protection	-	-	-	-	-	-	-	-	-	-	-	-	-
Forest Products	-	-	-	-	-	-	-	-	-	-	-	-	-
Forest Pathology	-	-	-	-	-	-	-	-	-	-	-	-	-
General Forestry	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber Preservation	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	0	3	0	0	0	0	0	0	0	0	0	0	0

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Farm Forestry	-	-	-	-	-	-	3	-
Forest Protection	-	-	-	-	-	-	-	-
Forest Products	-	-	-	-	-	-	-	-
Forest Pathology	-	-	-	-	-	-	-	-
General Forestry	-	-	-	-	-	-	-	-
Timber Preservation	-	-	-	-	-	-	-	-
Woodland Management	-	-	-	-	-	-	-	6
Total credits	0	0	0	0	0	0	3	6

[a]No specifications were reported.

Table 12. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Farm Forestry	-	-	-	-	-	-	-	-	-	-	-
Forest Protection	-	-	-	-	-	-	-	-	-	-	-
Forest Products	-	-	-	-	-	-	-	-	-	-	-
Forest Pathology	-	-	-	-	-	-	-	-	-	-	-
General Forestry	-	-	-	-	-	-	-	-	-	-	-
Timber Preservation	-	-	-	-	-	-	-	-	-	-	-
Total credits	0	0	0	0	0	0	0	0	0	0	0

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Farm Forestry	3.3	3	3.3	2	3	-	-	3	2	-	2
Forest Protection	-	-	-	-	-	-	-	-	-	-	-
Forest Products	-	-	-	-	-	-	-	-	-	-	-
Forest Pathology	-	-	-	-	-	-	-	-	-	-	-
General Forestry	-	-	-	-	-	-	-	-	-	-	-
Timber Preservation	-	-	-	-	-	-	-	-	-	-	-
Total credits	3.3	3	3.3	2	3	0	0	3	2	0	2

[b]Not specified; see Table 7 for total credits in technical agriculture.

Table 13. Semester credits in specific courses in horticulture required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Floriculture	-	-	-	-	-	-	-	-	-	-	3.3	-	-
Fruit Growing, General	-	-	-	-	-	-	-	-	-	-	-	-	-
Grapes & Small Fruits	-	-	-	-	-	-	-	-	-	-	-	-	-
Horticulture, General	-	3	2	-	-	-	-	-	-	2	-	2	3
Landscaping	-	-	-	-	-	-	-	-	-	-	-	-	-
Orcharding	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Propagation	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetable Crops, Advanced	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetable Crops	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	0	3	2	0	0	0	0	0	0	2	3.3	2	3

Course area	B. North Atlantic Region						
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Floriculture		-	-	-	-	-	-	-
Fruit Growing, General		-	-	-	-	-	-	-
Grapes & Small Fruits		-	-	-	-	-	-	-
Horticulture, General		-	-	-	-	-	-	-
Landscaping		-	-	-	-	-	-	-

[a]No specifications were reported.

Table 13. (Continued)

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Orcharding		-	-	-	3	-	-	-
Plant Propagation		-	-	-	-	-	-	-
Vegetable Crops, Advanced		-	-	-	-	-	-	-
Vegetable Crops		3	-	3	3	3	-	-
Total credits		3	0	3	6	3	0	0

Course area	Ariz.	Calif.[b]	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Floriculture	-		-	-	-	-	-	-	-	-	-
Fruit Growing, General	-		-	-	-	-	-	-	-	-	-
Grapes & Small Fruits	-		-	-	-	-	-	-	-	-	-
Horticulture, General	-		3.3	-	-	-	4	2	-	3	-
Landscaping	-		-	-	-	-	-	-	2	-	-
Orcharding	-		-	-	-	-	-	-	-	-	-
Plant Propagation	-		-	-	-	-	-	-	-	-	-
Vegetable Crops, Advanced	-		-	-	-	-	-	-	-	-	-
Vegetable Crops	-		-	-	-	-	-	-	-	-	-
Total credits	0		3.3	0	0	0	4	2	2	3	0

[b]Not specified; see Table 6 for total credits in technical agriculture.

Table 13. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Floriculture	-	-	-	-	-	-	-	-	-	-	-
Food Preservation	-	-	-	-	-	-	-	3	-	-	-
Fruit Growing, General	-	-	-	-	-	-	-	-	-	-	-
Grapes & Small Fruits	-	-	-	-	-	-	-	-	-	-	-
Horticulture, General	-	3	-	3	3	-	3	3	4	3	-
Landscaping	3.3	-	-	-	3	-	-	3	-	-	-
Orcharding	3.3	-	-	-	-	-	-	-	-	-	-
Plant Propagation	-	-	-	-	-	-	-	-	-	-	-
Vegetable Crops, Advanced	-	-	-	-	-	-	-	-	-	-	-
Vegetable Crops	3.3	-	-	-	-	-	-	-	-	-	-
Total credits	9.9	3	0	3	6	0	3	9	4	3	0

Only the Ohio State University in the Central Region required a course in floriculture. Five institutions required general horticulture courses. All were 2 or 3 semester credit courses. Seven institutions did not require any specific course in the horticulture area.

In the North Atlantic Region three institutions required no specific courses in horticulture. The University of New Hampshire required a 3 semester credit course in orcharding. Vegetable production courses, each for 3 semester credits, were required by four institutions. No other courses in the horticulture area were required by any of the institutions in the region.

Five institutions in the Pacific Region required no specific courses in horticulture. The Utah State University required 2 semester credit course in landscaping. General horticulture courses were required by four institutions. They carried from 2 to 4 semester credits. No other specific courses in horticulture were required by any institution in the region.

In the Southern Region, Auburn University required a 3.3 semester credit course in vegetable crops and a 3.3 semester credit course in orcharding. Landscaping courses were required by three institutions. Seven institutions required general horticulture courses each carrying from 3 to 4 semester credits. Clemson College required a 3 semester credit

course in food preservation. No other specific courses in horticulture were required by any institution in the Southern Region.

Specific courses required in soil science Presented in Table 14 is a summary of the credits and specific courses in soil science required of all agricultural education majors.

All institutions except the Michigan State University in the Central Region required basic soils courses carrying from 2 to 5.3 semester credits. Only two institutions required specific courses in soil fertility. Soil conservation and erosion control and soil survey courses were not required by any institution.

In the North Atlantic Region, basic soils courses were required by all institutions. They carried from 3 to 5 semester credits. Only the University of New Hampshire required a specific course in fertilizers. The University of Maine required 3 semester credit course in soil management. Soil conservation and erosion control courses were not required by any institution in the region.

All institutions in the Pacific Region except the University of Idaho required basic soils courses carrying from 2.6 to 4 semester credits. The Colorado State University required a 3.3 semester credit course in soil conservation and erosion control. A soil fertility course for 3 semester credits was required by the Washington State University. None

Table 14. Semester credits in specific courses in soil science required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Fertilizers	-	-	-	-	-	-	-	-	-	-	-	-	-
Soils, Basic	4	3	2.6	4	4	-	2.6	5	3	5.3	3.3	4	4
Soil Conservation & Erosion Control	-	-	-	-	-	-	-	-	-	-	-	-	-
Soil Fertility	-	-	2.6	-	-	-	-	-	-	-	0.8	-	-
Soil Survey	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	4	3	5.2	4	4	0	2.6	5	3	5.3	4.1	4	4

Course area	B. North Atlantic Region							
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Fertilizers		-	-	-	3	-	-	-
Soils, Basic		4	3	4	4	5	4	3
Soil Conservation & Erosion Control		-	-	-	-	-	-	-
Soil Fertility		-	-	-	-	-	-	-
Soil Management		-	3	-	-	-	-	-
Soil Survey		-	-	-	-	-	-	-
Total Credits		4	6	4	7	5	4	3

[a]No specifications were reported.

Table 14. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Fertilizers	-	-	-	-	-	-	-	-	-	-	-
Soils, Basic	3	3	4	-	2.6	4	4	4	2.6	3	3
Soil Conservation & Erosion Control	-	-	3.3	-	-	-	-	-	-	-	-
Soil Fertility	-	-	-	-	-	-	-	-	-	3	-
Soil Survey	-	-	-	-	-	-	-	-	-	-	-
Total credits	3	3	7.3	0	2.6	4	4	4	2.6	6	3

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Fertilizers	-	-	-	-	3	-	-	3	-	-	-
Soils, Basic	3.3	4	3.3	4	4	4	4	3	2	4	2
Soil Conservation & Erosion Control	-	-	-	-	-	-	-	-	-	4	-
Soil Fertility	-	-	-	4	-	-	-	-	-	-	-
Soil Survey	-	-	-	-	-	-	-	-	-	-	-
Total credits	3.3	4	3.3	8	7	4	4	6	2	8	2

of the institutions in the region required specific courses related to fertilizers or soil survey.

In the Southern Region, basic soils courses were required by all institutions. They carried from 2 to 4 semester credits. The Louisiana State University required 4 semester credits in soil fertility. The Mississippi State University and Clemson College were the only institutions that required specific courses in fertilizers. None of the institutions in the region required soil conservation and erosion control courses.

Specific courses required in biological science A summary of the specific courses and credits required in biological science is presented in Table 15.

In the Central Region the Ohio State University was the only institution which did not require any specific courses in the biological sciences. Botany was required by 12 institutions. The number of credits ranged from 2 to 6.6 semester credits. The University of Minnesota was the only institution that required a course in plant pathology. A plant physiology course carrying 5 semester credits was required by the University of Wisconsin. The Iowa State University was the only institution that required a specific course in weed identification. Five institutions required 2, 3 or 4 semester credit courses in genetics. Zoology courses, 2.4 to 4 semester credits, were required by eight of the 13 institutions in

Table 15. Semester credits in specific courses in biological sciences required of all agricultural education majors, by region and state

A. Central Region

Course area	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Bacteriology	-	4	-	-	4	-	3.3	-	3	2.6	-	3.3	4
Biology	-	-	-	-	-	-	6.6	-	-	-	-	-	-
Botany	4	3	2	4	4	6.6	-	5	3	2.6	-	-	5
Entomology, General	-	3	-	-	-	-	2.6	-	3	-	-	3.3	-
Entomology, Economic	-	-	-	-	-	-	-	-	-	2.6	-	-	-
Genetics	-	-	2	-	-	-	-	-	4	2	-	2	3-4[a]
Plant Physiology	-	-	-	-	-	-	-	-	-	-	-	-	5
Plant Pathology	-	-	-	-	-	-	3.3	-	-	-	-	-	-
Zoology	4	4	3.3	4	-	2.6	-	-	3	2.6	-	2.4	-
Weed Identification	-	-	2.6	-	-	-	-	-	-	-	-	-	-
Other in the area	-	1	-	-	-	3.8	-	-	-	-	-	-	-
Total credits	8	15	9.9	8	8	13	15.8	5	16	12.4	0	11	17-18

B. North Atlantic Region

Course area	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Agricultural Bio-Chemistry	-	-	-	-	-	-	3	-
Bacteriology	-	-	3	-	-	-	-	
Biology	-	8	-	-	4	-	-	
Botany	-	-	4	4	-	-	-	4
Diseases of Plants	-	-	-	3	-	-	-	-

[a]Or Plant Pathology.

Table 15. (Continued)

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Entomology, General	-	3	4	-	3	-	-	-
Entomology, Economics	-	-	-	-	-	-	-	-
Genetics	-	-	3	-	-	-	-	-
Plant Physiology	-	-	-	-	-	-	-	-
Zoology	-	-	4	4	3	-	-	-
Other in the area	-	-	-	-	5	-	-	-
Total credits	0	11	18	11	15	0	3	4

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Animal Pathology	4	-	-	-	-	-	-	-	-	-	-
Bacteriology	-	-	-	4	3.3	-	-	-	3.3	-	-
Biology	-	-	-	-	-	-	4	-	-	-	-
Botany	4	5	6.6	4	3.3	3	4	4	3.3	3	3
Entomology, General	4	-	3.3	3	-	-	-	-	-	-	-
Entomology, Economic	-	-	-	-	-	-	-	-	-	3	2
Genetics	-	4	3.3	-	-	-	-	2	3.3	-	-
Plant Pathology	4	-	-	-	-	-	-	-	-	-	-
Plant Physiology	-	-	-	-	-	-	-	-	-	-	-
Zoology	-	4	3.3	4	3.3	2	-	-	3.3	3	3
Other in the area	-	-	-	-	-	-	8	2	-	-	-
Total credits	16	13	16.5	15	9.9	5	16	8	13.2	9	8

Table 15. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Bacteriology	-	4	-	4	-	-	-	-	2.6	-	-
Biology	-	-	-	6	-	-	-	-	-	-	-
Botany	3.3	4	-	-	3	4	4	7	2.6	3	2.6
Entomology, General	-	-	-	-	4	-	3	-	-	3	-
Entomology, Economic	3.3	-	-	-	-	-	-	3	-	-	-
Genetics	-	-	-	-	-	-	-	-	-	3	3.3
Plant Pathology	-	-	-	-	-	-	-	-	-	-	-
Plant Physiology	-	-	-	-	-	-	-	-	-	-	-
Zoology	3.3	4	-	-	3	4	3	4	4.6	-	5.3
Other in the area	5.1	-	-	-	-	-	-	-	3.2	-	1.8
Total credits	15	12	0	10	10	8	10	14	13	9	13

the region. Bacteriology courses were required by seven institutions. Only four institutions required specific courses in general entomology. The North Dakota Agricultural College required a 2.6 semester credit course in economic entomology.

The University of Connecticut and Cornell University of the North Atlantic Region did not require any specific courses in the biological science area. Agricultural bio-chemistry for 3 semester credits was required only by the Pennsylvania State University. The University of Maine required a 3 semester credit course in bacteriology. No other institution in the region required a bacteriology course. The University of Maine was the only state requiring a course in genetics and the University of Maryland was the only institution that required a course in diseases of plants. Three institutions required 4 semester credit courses in botany. Three or 4 semester credit courses in zoology were required by three institutions. None of the institutions in the region required specific courses in plant physiology or economic entomology. General entomology courses for 3 or 4 semester credits were required by three institutions. Only the University of Delaware and the University of New Hampshire required specific courses in biology.

Only the University of Arizona in the Pacific Region required a 4 semester credit course in animal pathology. A 4 semester credit course in biology was required by the New

Mexico State University. The University of Arizona only required a 4 semester credit course in plant pathology. None of the institutions required specific courses in plant physiology. All institutions in the region required from 3 to 6.6 semester credit courses in botany. Zoology courses were required by eight institutions. The courses ranged from 2 to 4 semester credits. Only three institutions required a bacteriology course. Economic entomology was required by two institutions. A genetics course was required by four institutions. The credits ranged from 2 to 4 semester credits.

In the Southern Region the University of Georgia was the only institution that did not require any specific courses in biological sciences. None of the institutions required plant physiology or plant pathology courses. The Louisiana State University required 6 semester credits in biology. Bacteriology courses were required by three institutions, credits ranged from 2.6 to 4. All institutions except those in Georgia and Louisiana required botany. Credits varied from 2.6 to 7 semester credits. Zoology courses were required by eight institutions. Credits ranged from 3 to 5.3. Only Auburn University and Clemson College required specific courses in economic entomology. Three institutions required general entomology courses ranged in credit from 3 to 4 semester credits. Only the Texas A. and M. College and the Virginia Polytechnic Institute required courses in genetics.

Specific courses required in communications The specific courses and credits required in communications are revealed by data in Table 16.

In the Central Region English composition courses were required by all institutions. Credits ranged from 4 to 6 semester credits. Only the Michigan State University required 6 semester credits in American thought and language. All but three institutions required speech courses with credits ranging from 1.3 to 3. A course related to using radio and television was not required by any institution. Only two institutions required courses in literature. Journalism courses were required by three institutions. Only Purdue University required a course in business writing. Two institutions required a specific exposition course.

All institutions in the North Atlantic Region required English composition with credits ranging from 3 to 12 semester credits. None of the institutions required a radio and television course. Only five institutions required a speech course. The University of New Hampshire was the only institution that required a course in technical reports. A literature course was required by only one institution. None of the institutions required a specific course in journalism.

In the Pacific Region, the University of Idaho was the only institution that required no specific courses in the communications area. The Utah State University required 6

Table 16. Semester credits in specific courses in communications required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
American Thought & Language	-	-	-	-	-	6	-	-	-	-	-	-	-
Business Writing	-	3	-	-	-	-	-	-	-	-	-	-	-
Communications	-	-	-	-	-	-	-	-	-	-	-	-	-
English Composition	6	6	6	6	6	-	4	6	8	6	6	6	6
Exposition	-	-	-	-	-	-	2	3	-	-	-	-	-
Journalism	-	-	2	3	-	-	-	-	-	-	-	2	-
Literature	-	-	-	-	-	-	2	-	-	-	-	2	-
Speech	3	3	2	2	-	-	2	3	-	2	-	1.3	2
Using Radio & TV	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	9	12	10	11	6	6	10	12	8	8	6	11.3	8

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
English Composition	-	3	6	12	6	6	6	12
Journalism	-	-	-	-	-	-	-	-
Literature	-	3	-	-	-	-	-	-
Speech	-	-	2	2	3	-	3	3
Technical Reports	-	-	-	-	3	-	-	-
Using Radio & TV	-	-	-	-	-	-	-	-
Other in the area	6[a]	-	2	-	-	-	-	-
Total credits	6	6	10	14	12	6	9	15

[a]No specifications were reported.

Table 16. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Basic Communications	-	-	-	-	-	-	-	-	6	-	-
English Composition	6	3	4	-	6	-	5	6	-	6	6
Journalism	-	-	2	-	-	-	2	2	-	2	-
Literature	-	-	-	-	-	-	-	-	-	-	-
Speech	3	3	2	-	2	2	2	2	-	3	2
Using Radio & TV	-	-	-	-	-	-	-	-	-	-	-
Other in the area	-	-	-	-	-	-	-	2-4	-	-	1
Total credits	9	6	8	0	8	2	9	12-14	6	11	9

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
English Composition	7	6	3.3	6	6	6	5	6	6	6	-
Journalism	-	-	-	-	-	-	2-3	-	-	-	-
Literature	-	-	3.3	3	-	-	-	6	-	-	-
Report Writing	-	-	-	-	-	-	-	-	-	2	-
Speech	-	2	3.3	2	3	-	2-3	3	2	2	-
Using Radio & TV	-	-	-	-	-	-	-	-	-	-	-
In the area, not specified	-	-	-	1	-	-	-	-	-	-	10
Total credits	7	8	9.9	12	9	6	9-11	15	8	10	10

semester credits in basic communications. All but one institutions required English composition with credits ranging from 3 to 6. All institutions required a speech course. Four institutions required (2 semester credit) courses in journalism. None of the institutions required any specific courses in using radio and television, or in literature.

All institutions in the Southern Region required English composition with credits ranging from 3.3 to 7 semester credits. Only the Oklahoma State University required a course in journalism. Speech was required by all but three institutions. None of the institutions required courses related to using radio and television. Literature courses were required by three institutions. Credits ranged from 3 to 6 semester credits.

Specific courses required in humanities In Table 17 is a summary of the specific courses and credits required in humanities of all agricultural education majors.

Seven institutions in the Central Region did not require any specific courses in the humanities area. None of the institutions required art, music, foreign language, or philosophy courses. The University of Illinois and the University of Wisconsin required 3 semester credits in history. A total of 8 semester credits in humanities were required by the Michigan State University. The Iowa State University required a specific course in library as well as 4 semester

Table 17. Semester credits in specific courses in humanities required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Art or Music	-	-	-	-	-	-	-	-	-	-	-	-	-
Foreign Language	-	-	-	-	-	-	-	-	-	-	-	-	-
History	3	-	-	-	-	-	-	-	-	-	-	-	3
Humanities	-	-	-	-	-	8	-	-	-	-	-	-	-
Library	-	-	0.7	-	-	-	-	-	-	-	-	-	-
Philosophy	-	-	-	-	-	-	-	-	-	-	-	-	-
Other in the area	1	3	-	-	-	-	-	-	-	-	-	4	-
Total credits	4	3	0.7	0	0	8	0	0	0	0	0	4	3

Course area	B. North Atlantic Region						
	Conn.[a]	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Art or Music		-	-	-	-	-	-	-
Foreign Language		-	-	-	-	-	-	-
History of American Government		1	-	6	-	-	3	-
Library		-	-	-	-	-	-	-
Philosophy		-	-	-	-	-	-	-
Other in the area		-	-	-	-	-	1	-
Total credits		1	0	6	0	0	4	0

[a]No specifications were reported.

Table 17. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Art or Music	-	-	-	-	-	-	-	-	2	-	3
Foreign Language	-	-	-	-	-	-	-	-	-	-	-
History	-	-	-	-	-	-	-	2	-	-	-
Library	-	-	-	-	-	-	-	-	-	-	-
Philosophy	-	-	-	-	-	-	-	-	-	-	-
Other in the area	3[a]	6[a]	7[a]	15[a]	-	3[a]	-	2[a]	-	3[a]	5[a]
Total credits	3	6	7	15	0	3	0	4	2	3	8

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Art or Music	-	-	-	-	3	-	-	3	-	-	-
Foreign Language	-	-	-	-	-	-	-	-	-	-	-
History	-	-	3.3	9	-	-	3	-	-	6	-
Library	-	-	-	-	-	3	-	-	-	-	-
Philosophy	-	-	-	-	-	-	-	-	-	-	-
Other in the area	-	4	-	-	3	-	-	-	-	-	-
Total credits	0	4	3.3	9	6	3	3	3	0	6	0

credits in humanities as prescribed electives.

In the North Atlantic Region five institutions did not require any specific courses in humanities. Three institutions required history of American Government with credit ranging from 1 to 6 semester credits. None of the institutions required art, music, foreign language, library, or philosophy courses.

Only two institutions in the Pacific Region required no specific courses in the humanities area. No institutions required specific courses in foreign language, library, and philosophy. The Oregon State University required a 2 semester credit course in history. The Utah State University and the University of Wyoming were the only institutions that required art or music courses.

In the Southern Region three institutions required no specific courses in the humanities area. None of the institutions required specific foreign language, or philosophy courses. The Mississippi State University and the North Carolina State College required 3 semester credit courses in art or music. A library course was required by the North Carolina State College. Four institutions required history courses ranging in credit from 3 to 9 semester credits.

Specific courses required in mathematics and statistics

The credits in specific courses required in mathematics and statistics are summarized by data in Table 18.

Table 18. Semester credits in specific courses in mathematics and statistics required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-
College Algebra	3-5	3	2	3	3	-	2	3	2	3	-	3.3	-
Elementary Mathematics Analysis	-	-	-	-	-	2.6	-	-	-	-	-	-	-
Statistics	-	-	-	-	-	-	-	-	-	2	-	-	-
Trigonometry	-	3	2	-	-	-	-	-	-	3	-	-	-
Other in the area	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	3-5	6	4	3	3	2.6	2	3	2	8	0	3.3	0

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Basic College Mathematics	-	3	-	-	-	-	-	3
Calculus	-	-	-	-	-	-	-	-
College Algebra	-	-	-	-	3	-	-	-
Statistics	-	-	-	-	-	-	-	-
Trigonometry	-	-	-	-	-	-	-	-
Other in the area	-	-	-	-	-	-	3[a]	3[a]
Total credits	0	3	0	0	3	0	3	6

[a]Not specified.

Table 18. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Calculus	–	–	–	–	–	–	–	–	–	–	–
College Algebra	3	–	–	–	2	3	–	2.6	–	3	–
General Mathematics	–	–	–	4	–	–	3	–	–	–	4
Statistics	–	–	–	–	2	–	–	–	–	3	–
Trigonometry	–	–	–	–	–	–	–	–	–	–	–
Other in the area	–	–	9.3[a]	–	–	–	–	–	–	–	–
Total credits	3	0	9.3	4	4	3	3	2.6	0	6	4

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Analytical Geometry	–	–	–	–	–	–	–	–	–	–	2
Calculus	–	–	–	–	–	–	–	–	–	–	–
College Algebra	3.3	3	3.3[b]	3	3	4	–	2	–	3	4
General Mathematics	–	–	–	–	–	–	–	–	4	–	–
Statistics	–	–	–	–	–	–	–	–	–	–	–
Trigonometry	–	–	–	3	–	–	–	2	–	–	2
Other in the area	–	–	–	–	–	–	–	–	–	–	–
Total credits	3.3	3	3.3	6	3	4	0	4	4	3	8

[b]Or trigonometry.

In the Central Region none of the institutions required a specific course in calculus. All but two institutions required college algebra with credit ranging from 2 to 3.3 semester credits. Only three institutions required trigonometry. The North Dakota Agricultural College was the only institution that required a 2 semester credit course in statistics. An elementary mathematics analysis course was required by the Michigan State University.

Four institutions in the North Atlantic Region required no specific courses in mathematics and statistics. The University of Delaware and the University of Vermont required 3 semester credit courses in basic college mathematics. College algebra (for 3 semester credits) was required by the University of New Hampshire. None of the institutions required specific courses in calculus, statistics, or trigonometry.

In the Pacific Region, two institutions required no specific courses in mathematics and statistics. None of the institutions required calculus or trigonometry. Only five institutions required college algebra with credits ranging from 2 to 3 semester credits. General mathematics was required by three institutions. The Montana State College and the Washington State University required statistics courses carrying 2 and 3 semester credits, respectively.

Only the Oklahoma State University in the Southern Region

required no specific courses in mathematics and statistics. Calculus and statistics courses were not required by any institution in the region. All but two institutions required college algebra courses with credit ranging from 2 to 4 semester credits. Three institutions required trigonometry. The Texas A. and M. College was the only institution that required a 4 semester credit course in general mathematics.

Specific courses required in physical education, hygiene, and military science The specific courses and credits required of all agricultural education majors in physical education, hygiene, and military science are indicated by the data in Table 19.

All institutions in the Central Region except three required military science with a range in credit from 3 to 8. Two institutions required specific courses in the areas of physical education, hygiene, and military science but no credits were granted. Only the University of Kentucky required a 1 semester credit course in hygiene. Physical education courses for credit were required by six institutions. Credits ranged from 2 to 4 semester credits.

In the North Atlantic Region no institution required a specific course in hygiene. Six institutions required military science with credits ranging from 3 to 8 semester credits. The University of Maine required 6 semester credits in military science but the credits were not counted for

Table 19. Semester credits in specific courses in physical education, hygiene, and military science required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Hygiene	-	-	-	-	1	-	-	-	-	-	0.6	-	-
Military Science	4	8	4	4	8	3	-	4	4	4	-	4	-
Physical Education	4	-	-	-	2	3	-	4	-	-	2	2	-
Other in the area	-	-	-	-	-	-	-	-	-	-	-	-	-
Total credits	8	8	4	4	11	6	0[a]	8	4	4	2.6	6	0[a]

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Hygiene	-	-	-	-	-	-	-	-
Military Science	-	4	R[b]	5	6	-	3-6	8[c]
Physical Education	-	2	R[a]	4	1	R[a]	4	4
Other in the area	0-8[d]	-	-	-	-	-	-	-
Total credits	0-8	6	0	9	7	0	7-10	12

[a]Required, no credit given.

[b]Six credits required but not counted for graduation.

[c]Or air science.

[d]No specifications were reported.

Table 19. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Hygiene	3	-	-	-	-	-	-	-	-	-	-
Military Science	4	8	6	-	-	4	8	2	-	-	6
Physical Education	2	-	1	-	2	4	2	2	-	2	2
Other in the area	-	-	-	-	4	-	-	-	-	3	-
Total credits	9	8	7	0	6	8	10	4	0	5	8

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Hygiene	-	-	-	4	3	-	-	3	-	-	-
Military Science	4	-	8	8	-	4	4-8	4	1.3	-	-
Physical Education	4	-	R[a]	-	3[e]	4	-	-	4	-	-
Other in the area	-	-	-	-	-	-	-	-	-	-	-
Total credits	8	0	8	12	6	8	4-8	7	5.3	0	0

[e]Or 3 credits in military science.

graduation. Physical education was required by seven institutions. The University of Maine and the Cornell University required physical education but no credits were granted.

Two institutions in the Pacific Region required no specific courses in physical education, hygiene, and military science. The University of Arizona only required a 3 semester credit course in hygiene. Military science was required by seven institutions. Credit ranged from 2 to 8 semester credits. All but three institutions required physical education with credits ranging from 1 to 4 semester credits.

In the Southern Region, three institutions required no specific courses in physical education, hygiene, and military science. All but four institutions required military science. Only five institutions required physical education. Credits ranged from 3 to 4 semester credits. The University of Georgia required physical education without credits.

Specific courses required in physical science In Table 20 is a summary of the credits and specific courses required of all agricultural education majors in the physical sciences.

In the Central Region all institutions except the Ohio State University required specific courses in the physical sciences. All institutions except the Ohio State University required chemistry courses with credits ranging from 6 to 11.3 semester credits. Geology courses were required by only

Table 20. Semester credits in specific courses in physical sciences required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Astronomy	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemistry	6-10	10	8.6	11	8-10	6	6.6	8	10	10	-	11.3	8-10
Geology	4	-	-	-	-	-	-	3	-	-	-	-	-
Physics	-	4	2	-	-	-	-	5	-	2.6	-	-	-
Other in the area	-	-	-	-	-	4	-	-	-	-	-	-	-
Total credits	10-14	14	10.6	11	8-10	10	6.6	16	10	12.6	0	11.3	8-10

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Astronomy	-	-	-	-	-	-	-	-
Chemistry	-	8	8	8	8	-	3	8[a]
Geology	-	-	-	-	-	3	-	-
Organic Chemistry	-	-	4	-	-	-	-	-
Physics	-	-	-	-	4	-	-	-
Other in the area	-	-	-	-	-	-	4	-
Total credits	0	8	12	8	12	3	7	8

[a]Or 6 credits physics.

Table 20. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Astronomy	-	-	-	-	-	-	-	-	-	-	-
Chemistry	8-10	8	6.6	-	5.3	4	8	6	10	12	9
Geology	-	-	-	-	-	-	-	-	-	-	-
Physics	4	4	-	-	4	-	-	2	-	-	-
Other in the area	-	-	-	-	3.7	1	4	-	-	-	-
Total credits	12-14	12	6.6	0	13	5	12	8	10	12	9

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Astronomy	-	-	-	-	-	-	-	-	-	-	-
Chemistry	6.6	10	10	7	8	8	8	8	10	11	12
Geology	-	-	-	-	-	-	-	-	2.6	-	2.6
Physics	3.3	-	3.3	-	-	-	-	4	5.3	-	4
Other in the area	-	-	3.7	-	-	-	-	-	-	3	2.4
Total credits	9.9	10	17	7	8	8	8	12	17.9	14	19

two institutions. The Purdue University, the Iowa State University, the University of Missouri, and the North Dakota Agricultural College were the only institutions that required specific courses in physics. Credits ranged from 2 to 5 semester credits. Astronomy was not required by any institution.

No specific courses in physical sciences were required by the University of Connecticut in the North Atlantic Region. All but two institutions required chemistry with credits ranging from 3 to 8 semester credits. Geology was required by only Cornell University. The University of Maine required a 4 semester credit course in organic chemistry. Physics was required (4 semester credits) by only the University of New Hampshire. None of the institutions required specific work in astronomy.

In the Pacific Region, the University of Idaho required no specific courses in the physical science area. All but one institution required specific courses in chemistry. Credits ranged from 4 to 12 semester credits. Only four institutions required physics with credits ranging from 2 to 4 semester credits. No specific course work was required in geology or astronomy by any institution in the region.

All institutions in the Southern Region required chemistry. Credits varied from 6.6 to 12 semester credits. Only five institutions required physics courses with credit ranging

from 3.3 to 5.3 semester credits. None of the institutions required a specific course in astronomy. Only the University of Tennessee and the Virginia Polytechnic Institute required courses in geology.

Specific courses required in social science The number of credits and the specific courses required in social science of all agricultural education majors are presented in Table 21.

Two institutions in the Central Region did not require specific courses in the social science area. General economics courses were required by seven institutions with credits ranging from 2 to 6 semester credits. Only four institutions required general psychology. Three institutions required specific courses in government. Two institutions required 3 semester credit courses in political science. The South Dakota State College was the only institution that required a course in general sociology. None of the institutions required a specific course in geography.

In the North Atlantic Region, three institutions required no specific courses in the social science area. The University of Maryland was the only institution that required a course (3 semester credits) in government. General psychology for 3 semester credits was required by the Pennsylvania State University and the University of Vermont. None of the institutions required specific courses in general sociology,

Table 21. Semester credits in specific courses in social sciences required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Economics, General	3	3	-	3	-	2	-	-	6	-	-	4	4
Geography	-	-	-	-	-	-	-	-	-	-	-	-	-
Government	-	-	2	-	-	-	-	-	-	2	-	2.6	-
Political Science	3	-	-	-	-	-	-	-	3	-	-	-	-
Psychology, General	4	-	2	-	-	-	4	-	-	-	-	2	-
Sociology, General	-	-	-	-	-	-	-	-	-	-	-	1.4	-
Other in the area	-	-	-	-	-	8	-	5	-	-	-	-	-
Total credits	10	3	4	3	0	10	4	5	9	2	0	10	4

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Economics, General	-	-	-	3	3	-	3	-
Geography	-	-	-	-	-	-	-	-
Government	-	-	-	3	-	-	-	-
Political Science	-	-	-	-	-	-	-	-
Psychology, General	-	-	-	-	-	-	3	3
Sociology, General	-	-	-	-	-	-	-	-
Other in the area	3	-	-	-	4	-	-	-
Total credits	3	0	0	6	7	0	6	3

Table 21. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Economics, General	-	3	2	-	2	3	3	2	-	4	-
Geography	-	-	-	-	-	-	-	-	-	-	-
Government	3	2	-	-	-	-	-	-	-	-	-
Political Science	-	-	-	-	-	-	-	2	-	3	3
Psychology, General	-	1	-	-	-	3	-	4	3.3	-	4
Sociology, General	-	-	-	-	-	-	-	2	-	-	-
Other in the area	-	-	-	-	4	-	-	-	-	3	1
Total credits	3	6	2	0	6	6	3	10	3.3	10	8

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Adolescent Psychology	-	-	-	3	-	-	-	-	-	-	-
Business Law	-	-	-	-	-	-	-	-	-	-	2
Economics, General	3.3	-	-	3[a]	3	3	-	3	4	3	3.3
Geography	-	-	-	-	-	-	-	-	-	-	-
Government	-	-	-	-	-	-	3	3	-	6	-
Political Science	-	-	3.3	-	-	-	-	-	-	-	-
Psychology, General	-	-	-	-	-	-	3	-	-	-	-
Sociology, General	3.3	-	-	-	-	-	-	-	-	-	-
Other in the area	5.4	-	-	-	6	9	-	-	-	-	-
Total credits	12	0	3.3	6	9	12	6	6	4	9	5.3

[a]Or General Sociology.

geography, and political science.

Only the University of Idaho in the Pacific Region required no specific course work in the social science area. Geography was not required by any institution in the region. All institutions except four required general economics with credit ranging from 2 to 4 semester credits. Only two institutions required specific course work in government. Three institutions required 2 to 3 semester credits in political science. Five institutions required general psychology courses. A general sociology course for 2 semester credits was required by the Oregon State University.

In the Southern Region only the University of Arkansas required no specific courses in the social science area. The Louisiana State University required a 3 semester credit course in adolescent psychology. Political science and general sociology courses were each required by one institution. All but three institutions required general economics courses with credits ranging from 3 to 4 semester credits. Only the Virginia Polytechnic Institute required a course in business law. None of the institutions required a geography course. Only the Oklahoma State University required a course in general psychology.

Specific courses required in agricultural education

The credits and specific courses required in agricultural education are revealed by data in Table 22.

Table 22. Semester credits in specific courses in agricultural education required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Agriculture & Extension Education	-	-	-	-	-	-	-	-	-	-	-	-	2
Developing & Supervising Farming Programs	-	-	-	-	-	-	2	2	2	2	-	-	-
Directed Student Teaching	5	5	6	5	9	10	4	6	7	6	10	5.3	7
Future Farmers of America	-	-	-	-	-	-	-	-	-	-	-	2	-
History & Philosophy of Vocational Education	-	-	-	-	-	-	-	-	2	-	-	-	-
Introduction to Vocational Agriculture	2	-	-	3	-	-	-	3	2	2	2	2	3
Methods of Teaching Adults	-	-	-	-	-	-	2.6	-	-	-	-	2	-
Methods of Teaching Farm Mechanics[a]	-	-	-	-	-	-	-	-	-	1.3	-	-	-
Methods of Teaching Young Farmers	-	-	-	-	-	-	2.6	-	-	-	-	-	-
Methods of Teaching Young and Adult Farmers	-	-	2.6	-	-	-	-	2	-	2	-	-	-

[a]See also Table 7.

Table 22. (Continued)

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Methods of Teaching Vocational Agriculture in High School	5	3	2.6	3	-	2	2.6	3	3	2	3.3	2.6	2
Observation & Survey of Programs in Agriculture	-	-	0.6	-	-	-	2	-	-	-	-	-	-
Planning & Evaluating the Programs in Vocational Agriculture	-	-	2	-	-	-	2	-	3	-	-	-	-
Seminar	-	-	-	-	-	-	-	-	-	0.6	-	-	-
Other in the area	2	-	-	-	9[b]	-	-	3	-	-	-	2.1	2
Total credits	14	8	13.8	11	18[b]	12	17.8	19	19	15.9	15.3	16	15

Course area	B. North Atlantic Region						
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Developing & Supervising Farming Programs	-	-	-	-	-	-	-	-
Departmental Management	-	-	-	1	-	-	-	-

[b]Eighteen credits in one block of work may be taken as undergraduate or graduate. If graduate then 9 credits are counted toward master of science degree.

Table 22. (Continued)

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Directed Student Teaching	-	6	8-10	7	17	6	10	6
Future Farmers of America	-	-	-	-	-	-	-	-
Introduction to Vocational Agriculture	-	-	3	-	-	-	2	-
Methods of Teaching Adults	-	-	-	-	-	-	-	-
Methods of Teaching Farm Mechanics[a]	-	-	-	-	-	-	2	-
Methods of Teaching Young Farmers	-	-	-	-	-	3	-	-
Methods of Teaching Young and Adult Farmers	-	3	-	1	-	-	-	3
Methods of Teaching Vocational Agriculture in High School	-	3	4	3	8	3	3	6
Observation & Survey of Programs in Agriculture	-	-	-	3	-	-	2-3	-
Planning & Evaluating the Programs in Vocational Agriculture	-	-	-	-	-	-	-	-
Rural Life & Education	-	-	-	3	-	-	-	-

Table 22. (Continued)

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Seminar	-	-	-	-	-	-	-	2
Teaching Farm Practice Demonstration	-	-	-	2	-	-	-	-
Other in the area	7-9	3	-	-	-	-	-	-
Total credits	7-9[c]	12	15-17	20	25	12	19-20	17

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Curriculum	-	-	-	-	-	-	-	2	-	-	-
Developing & Supervising Farming Programs	-	-	2	-	-	-	-	-	-	1	-
Directed Student Teaching	8	7	6	6	6	6	8	8	6	8	-
Future Farmers of America	-	-	1.3	2	-	2	-	-	-	1	-
Introduction to Vocational Agriculture	1	2	-	3	2.6	1	2	1.3	-	2	-
Methods of Teaching Adults	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching Farm Mechanics[a]	-	-	-	-	-	2	4	-	2	-	-

[c]No specifications were reported.

Table 22. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Methods of Teaching Young Farmers	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching Young and Adult Farmers	-	-	2	2	2	-	-	2	-	2	-
Methods of Teaching Vocational Agriculture in High School	4	3	3.3	5	2.6	3	8	2	3.3	2	-
Observation & Survey of Programs in Agriculture	-	1	-	2	-	-	-	-	-	R[d]	-
Planning & Evaluating the Programs in Vocational Agriculture	-	-	-	-	1.3	-	-	1.3	-	-	-
Seminar in Student Teaching	-	-	2	-	1.3	-	-	-	-	-	-
Other in the area	2		5.4	-	-	-	-	-	1.7	-	18[c]
Total credits	15	13	22	20	15.8	14	22	16.6	11.3	16	18

[d]Required, no credit given.

Table 22. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Developing & Supervising Farming Programs	-	-	-	3	-	1	-	-	2[e]	2	-
Directed Student Teaching	10	5	10	6	6	6	7	6	6	6[f]	6
Future Farmers of America	-	-	-	-	-	1	-	-	-	-	-
Introduction to Vocational Agriculture	2	2	-	3	3	1	3	3	-	3	-
Methods of Teaching Adults	-	-	-	-	3	2	-	3	-	-	-
Methods of Teaching Farm Mechanics[a]	-	3	-	-	-	-	2	-	-	-	-
Methods of Teaching Young Farmers	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching Young and Adult Farmers	3.3	2	3.3	3	-	-	-	-	2	2	-
Methods of Teaching Vocational Agriculture in High School	3.3	3	3.3	3	4	2	3	3	2	-	3.3

[e]Includes F.F.A.

[f]Includes Methods of Teaching Vocational Agriculture.

Table 22. (Continued)

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Observation & Survey of Programs in Agriculture	-	-	-	-	-	-	-	-	-	-	-
Planning & Evaluating the Programs in Vocational Agriculture	-	-	2	-	-	-	3	-	4	2	-
Teaching Out of School Groups	-	-	-	-	-	-	-	-	-	-	2
Vocational Teaching	-	-	-	-	-	-	-	-	-	-	2
Other in the area	2.4	-	-	-	-	2	-	-	-	-	-
Total credits	18.6	15	18.6	18	16	15	18	15	16	15	13.3

In the Central Region all institutions required directed student teaching with credits ranging from 4 to 10 semester credits. Methods of teaching vocational agriculture in high school courses were required by all but one institution. Credits ranged from 2 to 5 semester credits. Introduction to vocational agriculture courses were required by eight of the 13 institutions in the region. The University of Minnesota only required a (2.6 semester credits) course in methods of teaching young farmers. Methods of teaching young and adult farmers was required only by the Iowa State University, the University of Missouri, and the North Dakota Agricultural College. Only two institutions required specific courses in methods of teaching adults. Observation and survey of programs in agriculture courses were required by the Iowa State University and the University of Minnesota. Three institutions required courses concerned with planning and evaluating the program in vocational agriculture. Credits ranged from 2 to 3 semester credits. The University of Nebraska was the only institution that required a course (2 semester credits) concerned with the Future Farmers of America.

All institutions in the North Atlantic Region required directed student teaching with credits varying from 6 to 17 semester credits. Only two institutions required specific courses related to an introduction to vocational agriculture. Methods of teaching young and adult farmers was required by

three institutions. Only the Cornell University required a 3 semester credit course in methods of teaching young farmers. Courses relating to methods of teaching vocational agriculture in the high school were required by all institutions. Credits ranged from a low of 3 to a high of 8 semester credits. The University of Maryland required a one semester credit course in departmental management, a 3 semester credit course in rural life and education, and a 2 semester credit course in teaching farm practice demonstrations. None of the institutions required specific courses in Future Farmers of America or in planning and evaluating programs in vocational agriculture.

All institutions in the Pacific Region required directed student teaching with credits ranging from 6 to 8 semester credits. Only the Oregon State University required a 2 semester credit course in curriculum planning. Future Farmers of America courses were required by four institutions. Credits ranged from 1 to 2 semester credits. All but two institutions required courses concerned with an introduction to vocational agriculture. Credits varied from 1 to 3 semester credits. None of the institutions required specific courses in methods of teaching adults or methods of teaching young farmers. All institutions required courses dealing with methods of teaching vocational agriculture in high school. These courses carried from 2 to 8 semester credits. Courses relating to planning and evaluating programs in vocational agriculture were required by

only two institutions. Three institutions required courses concerned with observation and survey of programs in agriculture.

In the Southern Region all institutions required directed student teaching with a range of 5 to 10 semester credits. Only the North Carolina State College required a course in Future Farmers of America. Introduction to vocational agriculture courses were required by all but three institutions. All institutions except one required courses concerning methods of teaching in high school. Credits ranged from 2 to 4 semester credits. Courses in methods of teaching adults were required by three institutions with credits ranging from 2 to 3 semester credits. None of the institutions required specific courses in observation and survey of programs in agriculture, or in methods of teaching young farmers. Six institutions required courses relating to methods of teaching young and adult farmers. The courses were for 2 to 3.3 semester credits. The Virginia Polytechnic Institute required a 2 semester credit course in teaching out of school groups and a 2 semester credit course in vocational teaching. Only four institutions required specific courses in planning and evaluating the programs in vocational agriculture.

Specific courses required in education and psychology

Data in Table 23 summarize the credits and specific courses required in education and psychology of all majors in agricul-

Table 23. Semester credits in specific courses in education and psychology required of all agricultural education majors, by region and state

Course area	A. Central Region												
	Ill.	Ind.	Iowa	Kan.	Ky.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wis.
Adolescent Psychology	-	-	-	-	-	-	-	-	-	2	-	-	-
Audio-Visual Methods in Education	-	-	-	-	-	-	-	-	-	-	-	-	-
Child Psychology	-	-	-	-	-	-	-	-	-	-	-	-	-
Developmental Psychology	-	-	2	-	-	-	-	-	-	-	-	-	2
Educational Psychology	3	3	2	6	-	4	-	3	3	2	-	2	2
History of American Education	-	3	2	-	-	-	-	-	-	-	-	-	2
Method of Teaching Biology	-	2	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching	-	-	2.6	-	-	-	-	-	-	-	-	-	2
Principles & Practices of Guidance	-	-	-	-	-	-	-	-	-	-	-	-	-
Principles of Secondary Education	-	2	2	3	-	4	3.3	2	-	2	-	2	-
Other in the area	-	-	-	-	-	-	-	-	-	-	-	2	-
Total credits	3	10	10.6	9	0	8	3.3	5	3	6	0	6	8

Table 23. (Continued)

Course area	B. North Atlantic Region							
	Conn.	Del.	Maine	Md.	N.H.	N.Y.	Penn.	Vt.
Audio-Visual Methods in Education	-	-	-	-	-	-	-	-
Child Psychology	-	6	-	-	-	-	-	-
Developmental Psychology	-	-	-	-	-	-	-	-
Educational Psychology	-	-	-	6	3	3	3	-
History of American Education	-	-	-	-	-	-	-	-
Methods of Teaching	-	-	-	-	-	-	-	-
Principles & Practices of Guidance	-	-	-	-	-	-	-	-
Principles of Secondary Education	-	-	-	-	3	-	-	-
Other in the area	15[a]	-	-	-	-	-	3	-
Total credits	15	6	0	6	6	3	6	0

[a]No specifications were reported.

Table 23. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Administration of Secondary Education	-	-	-	-	-	-	-	-	2	-	-
Audio-Visual Methods in Education	-	2	2	-	-	-	-	-	-	-	-
Child Psychology	-	-	-	-	-	-	-	-	2	-	-
Developmental Psychology	-	-	-	3	-	-	-	-	-	-	-
Educational Psychology	3	3	2	-	2	2	3	2	2	-	3
History of American Education	-	-	-	-	-	-	-	-	-	2	-
Methods of Teaching	-	-	-	-	-	-	-	-	-	8	-
Nevada School Law	-	-	-	-	-	2	-	-	-	-	-
Orientation	-	-	-	-	-	-	3	-	-	-	-
Philosophy Foundation	-	-	-	-	-	5	-	-	-	-	3
Principles & Practices of Guidance	-	-	-	-	-	2	-	-	2	-	-
Principles of Secondary Education	-	-	-	3	2	-	-	2	-	2	-
Principles of Vocational Education	2	-	-	-	-	-	-	-	-	-	-
Reading Methods	-	-	-	-	-	-	-	2	-	-	-
School Health	-	-	-	-	-	-	-	-	1	-	-

Table 23. (Continued)

Course area	C. Pacific Region										
	Ariz.	Calif.	Col.	Idaho	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.
Social Foundation of Education	-	-	-	-	-	-	3	-	-	-	-
Other in the area	-	-	-	3	-	-	-	-	-	-	4
Total credits	5	5	4	9	4	11	6	6	9	12	11

Course area	D. Southern Region										
	Ala.	Ark.	Ga.	La.	Miss.	N.C.	Okla.	S.C.	Tenn.	Texas	Va.
Audio-Visual Methods in Education	2.6	-	-	-	-	-	-	-	-	-	2
Child Psychology	-	-	-	-	-	-	-	-	-	-	-
Developmental Psychology	3.3	-	-	-	3	2	-	-	-	-	-
Educational Psychology	3.3	-	3.3	-	3	3	3	3	-	3	2
History of American Education	-	-	-	-	-	-	-	-	-	-	-
Methods of Teaching	-	3	-	-	-	-	-	-	-	-	-
Principles & Practices of Guidance	4	-	-	-	-	2	-	-	-	-	-
Principles of Secondary Education	4	-	-	-	-	2	-	-	3	-	-
Other in the area	-	-	-	-	-	-	-	-	3	-	-
Total credits	17.2	3	3.3	0	6	9	3	3	6	3	4

tural education.

All but two institutions in the Central Region required educational psychology with from 2 to 6 semester credits required. Principles of secondary education courses were required by eight institutions with credits varying from 2 to 4 semester credits. Only the North Dakota Agricultural College required a 2 semester credit course in adolescent psychology. Two institutions required 2 semester credit courses in developmental psychology. Only the Iowa State University required a special course in methods of teaching. None of the institutions required specific courses in audio-visual methods in education, child psychology or in principles and practices of guidance.

In the North Atlantic Region, the University of Delaware required 6 semester credits in child psychology. Educational psychology was required by four institutions with credits ranging from 3 to 6 semester credits. Only the University of New Hampshire required a 3 semester credit course in principles of secondary education. None of the institutions required specific courses in audio-visual methods in education, developmental psychology, history of American education, methods of teaching, or principles and practices of guidance.

All but one institution in the Pacific Region required educational psychology with credits ranging from 2 to 3 semester credits. The University of California and the Colorado

State University required 2 semester credits in audio-visual methods in education. The Washington State University was the only institution that required 8 semester credits in methods of teaching. Principles and practices of guidance courses were required by the University of Nevada and the Utah State University. Only three institutions required specific courses in principles of education. The University of Idaho was the only institution that required a course in developmental psychology. An administration of secondary education course was required by the Utah State University. Two institutions required 2 semester credit courses in principles of vocational education.

Only Auburn University and the North Carolina State College in the Southern Region required specific courses in principles and practices of guidance for 2 and 4 semester credits respectively. An audio-visual methods in education course for 2.6 semester credits was required by the Auburn University, and a 2 semester credit course was required by the Virginia Polytechnic Institute. All but two institutions required educational psychology courses with credits ranging from 2 to 3.3 semester credits. Only three institutions required principles of secondary education courses. Credits ranged from 2 to 4 semester credits. The University of Arkansas was the only institution which required a course in methods of teaching. Three institutions required specific

courses in developmental psychology. Child psychology and history of American education courses were not required by any institution in the region.

Selected Features of the Curricula in Agricultural Education

Qualifications required of candidates for entering the curricula

Qualifications required of candidates entering the curricula in agricultural education are presented in Table 24 according to region and state. No vocational agriculture in high school was required to enter the curricula in 43 institutions.

The grade point average required for students to enter the agricultural education curricula varied greatly among the institutions as shown by data in Table 24. The grade point average required varied from none in 12 institutions to 2.3 or more in 16 institutions. The use of aptitude and achievement tests by institutions in selecting agricultural education candidates was not being made in 22 institutions. A test in English language was required by six institutions. Six institutions used the Strong Interest and Vocational Test in selecting students to enter the curriculum in agricultural education. The College Board Test, used with other university students, was required by six institutions.

According to the data in Table 24, farm experience after

Table 24. Qualifications required of candidates entering the curriculum in agricultural education, by region and state

Region and state	Years of farm experience after 14 years of age	High school vocational agriculture required	Grade point average	Aptitude and achievement tests used
A. Central Region				
Illinois	2	None	3.5	MMPF
Indiana	2	None	4.0[a]	Purdue Entrance Tests, English, Math., Physical Science, MTAI, GZTS
Iowa	2	None	2.3	Strong Interest, ACT, Zimmerman-Temperament, MSAT
Kansas	2	None	None	Strong Vocational, ACT, Ohio Psychological
Kentucky	3	None	2.5[b]	None
Michigan	2	None	2.0	Same as for all University students[c]
Minnesota	2[d]	None	2.3[e]	None
Missouri	3[f]	None	2.0	None
North Dakota	None	None	None	None

[a]On 6 point basis.

[b]On 4 point basis.

[c]And Strong Vocational Interest Inventory.

[d]Or lived on farm until age 16.

[e]Average in all technical agriculture courses or upper 75 per cent of high school class.

[f]Or farm reared.

Table 24. (Continued)

Region and state	Years of farm experience after 14 years of age	High school vocational agriculture required	Grade point average	Aptitude and achievement tests used
A. Central Region				
Nebraska	2	None	4.0[g]	None
Ohio	2	None	2.0	Average of C in English, Health & Physical approval
South Dakota	2	None	2.0	SCAT, English Placement Test, Diagnostic Reading Test
Wisconsin	Age 16[h]	None	2.5	None
B. North Atlantic Region				
Connecticut	2	None	2.2	Upper 50%[i]
Delaware	2 or equivalent	None	None	None
Maine	2	None	None	None
Maryland	3 or equivalent	None	None	None
New Hampshire	2	None	2.0	ACE, College Board
New York	1-2[j]	None	Upper 75% of class	College requirements, SAT, English
Pennsylvania	None[k]	None	2.0	Strong Interest, RE, Minn. Apt.
Vermont	1	None	None	None

[g]On 9 point basis.

[h]Or 2 years after age 16.

[i]Based on scores made by entering freshmen.

[j]Or 40 units of farm experience.

[k]But strongly encouraged - two years after age 10 and before graduation.

Table 24. (Continued)

Region and state	Years of farm experience after 14 years of age	High school vocational agriculture required	Grade point average	Aptitude and achievement tests used
C. Pacific Region				
Arizona	1-2	None	2.5	None
California	3	None	None	None
Colorado	3	None	2.5	C.B.E.E.
Idaho	2	None	2.0	College Entrance Test
Montana	2	None	None	Strong & Kuder, Ohio 78, CPI, Minn. Mult., Phusic Bennet, General Entrance Tests
Nevada	2	None	2.3[b]	None
New Mexico	Not specified	None	2.0	ACT, Miller Strong Vocational
Oregon	2	None	2.25	None
Utah	3[l]	None	Same as University	Same as University, Coop. English Test, College Ability Test
Washington	2[m]	None	2.0	None
Wyoming	3	None	3.0	Ohio 40 Pr.
D. Southern Region				
Alabama	None	None	None	None
Arkansas	2	None	2.0	None[n]
Georgia	2	None	78	None
Louisiana	2	None	C average[o]	None

[l]After age 16 or farm reared.

[m]Or farm reared to 14 years.

[n]Speech proficiency to begin next year.

[o]Or 1 out of 3.0 minimum.

Table 24. (Continued)

Region and state	Years of farm experience after 14 years of age	High school vocational agriculture required	Grade point average	Aptitude and achievement tests used
Mississippi	2	None	C average in Voc.Ag.	None
North Carolina	Not specified	None	Not specified	Same as college uses, interest in agricultural education
Oklahoma	4	None	2.0[p]	STEP, Minn. Teacher Aptitude
South Carolina	3	None	1.8	None
Tennessee	None	None	2.0	None
Texas	Variable	None[q]	None	None
Virginia	2[f]	None	1.0	College Entrance Test

[p]A equal 4.0.

[q]But desirable.

14 years of age was a qualification required for entry in the curricula in agricultural education by over one-half of the institutions involved in the study. The majority of the institutions required two years of farm experience after the age of 14 years. Eight of 43 institutions required three years of farm experience after the age of 14 years. Only the Oklahoma State University required four years of farm experience after 14th birthday. Four institutions did not require candidates to have farm experience.

Time when candidates enter or declare the curriculum in agricultural education as their field of specialization

The time when students ordinarily enter the curricula in agricultural education or declare it as their field of specialization varied greatly among the institutions. An inspection of information presented in Table 25 revealed that in 18 of the 43 institutions the candidates declared agricultural education as their major field of specialization when they were freshmen. In 12 institutions the candidates indicated their major in the sophomore year. In 14 institutions the students entered the agricultural education curricula at the start of the junior year. In six institutions the students declared their major during the senior year. Three of these states, Arizona, Idaho and Washington, are in the Pacific Region.

Six institutions in the Central Region and six in the Pacific Region followed the practice of having candidates enter the agricultural education curriculum as freshmen.

Student teaching participation experience in actual teaching of classes and farming program supervision

Presented in Table 26 are data concerning student teaching participation experience according to the number of class sessions taught and the type of farming programs supervised. An inspection of the median number of high school classes

Table 25. Time when candidates ordinarily enter the curriculum in agricultural education or declare it as their field of specialization, by region and state

Region and state	Freshman	Sophomore	Junior	Senior
A. Central Region				
Illinois			X	
Indiana	X[a]			
Iowa	X			
Kansas	X			
Kentucky				X
Michigan	X			
Minnesota	X			
Missouri	X			
Nebraska		X		
North Dakota	X	X		
Ohio		X		
South Dakota			X	
Wisconsin[b]			X	
Total	6	3	3	1
B. North Atlantic Region				
Connecticut			X	X[c]
Delaware			X	
Maine		X		
Maryland	X			
New Hampshire	X			
New York	X	X	X	
Pennsylvania		X		
Vermont		X		
Total	3	4	3	1

[a]As tentative but sophomore year is final.

[b]Data were not provided.

[c]As graduate also.

Table 25. (Continued)

Region and state	Freshman	Sophomore	Junior	Senior
C. Pacific Region				
Arizona	X		X	X
California	X			
Colorado	X			
Idaho				X
Montana		X		
Nevada		X		
New Mexico	X			
Oregon	X	X		
Utah	X		X[d]	
Washington				X
Wyoming		X		
Total	6	4	2	3
D. Southern Region				
Alabama			X	
Arkansas			X	
Georgia				X
Louisiana		X		
Mississippi			X	
North Carolina	X			
Oklahoma			X	
South Carolina	X			
Tennessee			X	
Texas			X	
Virginia	X			
Total	3	1	6	1

[d]Transfer from Junior Colleges.

taught in the regions indicates a low of 40 class sessions in the North Atlantic Region and a high of 60 class sessions in the Pacific Region. The number of high school class sessions taught by the student teacher varied among the institutions

Table 26. Student teaching participation experience - number of class sessions taught and type of farming programs supervised, by region and state

Region and state	No. of class sessions taught			Supervision of farming programs					
				High school		Young farmers		Adult farmers	
	High school classes	Young farmers	Adult farmers	No. boys	No. weeks	No. farmers	No. weeks	No. farmers	No. weeks
A. Central Region									
Illinois	55	1	4	15	10	7	7	10	7
Indiana	60-70	0	0	1+	4	0	0	0	0
Iowa	50-70[a]	2	2	14	6	6	6	15	6
Kansas	45	4	2	20	4	10	4	5	4
Kentucky	1/3 of time	helps	helps	8-10	16	2-4	16	0[b]	0[b]
Michigan	30	1-2	2-3	10-15	11	2-3	11	3-5	11
Minnesota	55	2	2	10	1	3	1	5	1
Missouri	25	1	1	1-2	4	0	0	0	0
Nebraska	44	2	3	10	7	2[d]	6	2	6
North Dakota	35-50	0[c]	2-3[c]	0[d]	0[d]	0[d]	0[d]	0[d]	0[d]
Ohio	40	2	3	3	11	5	11	6	11

[a]Two classes per day for 5 weeks.

[b]Observes regular teacher.

[c]Assists with instruction of 2 to 3, adult and young farmer classes.

[d]He makes visits under the direction of supervising teacher.

Table 26. (Continued)

Region and state	No. of class sessions taught			Supervision of farming programs					
				High school		Young farmers		Adult farmers	
	High school classes	Young farmers	Adult farmers	No. boys	No. weeks	No. farmers	No. weeks	No. farmers	No. weeks
A. Central Region									
South Dakota	45[e]	0[f]	0[f]	0[f]	0[f]	0[f]	0[f]	0[f]	0[f]
Wisconsin	60	1	2	10	7[g]	0[h]	0[h]	0[h]	0[h]
Median	45	1	2	10	7	2.5	5	3	1
B. North Atlantic Region									
Connecticut	40	1-2	1-2	varies		varies		varies	
Delaware	140	0	0	0[i], 3+[j]	0[i]	0[i]	0[i]	0[i]	0[i]
Maine	28	1-2	1-2		8	0	0	0	0

[e]Minimum.

[f]No requirements.

[g]And follows one boy through the entire semester or longer.

[h]He makes farm visits usually with the supervising teacher to young and adult farmer for instructional purposes.

[i]Visits the farming programs with the experienced teacher; time too short to take program over.

[j]Visits home farms of all boys in his class, plus working with three specific boys on farming programs.

Table 26. (Continued)

Region and state	No. of class sessions taught: High school classes	Young farmers	Adult farmers	Supervision of farming programs: High school No. boys	High school No. weeks	Young farmers No. farmers	Young farmers No. weeks	Adult farmers No. farmers	Adult farmers No. weeks
Maryland	75[k]	2[k]	2[k]	5-8	6-1/2	-	6[l]	-	6[l]
New Hampshire	3	1	0	-	8	-	1	0	0
New York	2-3	1	0	8-12	15	3-5	10	0	0
Pennsylvania	most	2-3	2-3	0	0	0	0	0	0
Vermont	-[m]	3-4	3-4	30	8	15	4	0	0
Median	40	1.5	1.5	4.75	8	0	1	0	0
C. Pacific Region									
Arizona	90	0	2	3	4	0	0	0	0
California	3	1	0	20	18	0[n]	0[n]	0[n]	0[n]
Colorado	25	1	2	4	6	1[o]	6[o]	0	0
Idaho	50	5[p]	5[p]	10	5	0	0	0	0

[k]Average.

[l]Visits.

[m]Was not reported.

[n]Contact only.

[o]Or adult farmers.

[p]When available.

Table 26. (Continued)

Region and state	No. of class sessions taught			Supervision of farming programs					
				High school		Young farmers		Adult farmers	
	High school classes	Young farmers	Adult farmers	No. boys	No. weeks	No. farmers	No. weeks	No. farmers	No. weeks
Montana	60	0	0[q]	10	5	0	0	0	0
Nevada	20	0	1-2	10-20	6	0	0	0	0
New Mexico	96	0	0	10	7	0	0	0	0
Oregon	150	0	0	40	8	0	0	0	0
Utah	90	2	0	20[r]	5	3	5	0	0
Washington	85	0	0	15	9	0	0	0	0
Wyoming	2.5	2	2	2	4	2	4	0	0
Median	60	0	0	10	6	0	0	0	0
D. Southern Region									
Alabama	180	4	6	10	12	4	8	6	8
Arkansas	50	2-5	2-5	10	6	2	6	5	6
Georgia	45	0	6	20	11	0	0	15	11
Louisiana	94	1	3	24	5	6	5	12	5
Mississippi	60	0	3	-	6	0	0	-	6
North Carolina	variable[s]		variable[s]	variable[s]		variable[s]		variable[s]	

[q]Some observation.

[r]Responsible for four or five boys on his own initiative.

[s]Has full responsibility for one class of boys and for organizing and teaching one class.

Table 26. (Continued)

Region and state	No. of class sessions taught			Supervision of farming programs					
				High school		Young farmers		Adult farmers	
	High school classes	Young farmers	Adult farmers	No. boys	No. weeks	No. farmers	No. weeks	No. farmers	No. weeks
Oklahoma	45	2	2	4	6	2[o]	6[o]	0	0
South Carolina	30	2	2	20	8	12	8	10	8
Tennessee	80	0	1-2	25	7	0	0	2-3	2
Texas	2	0	0	15	6	0	0	0	0
Virginia	125	2	2	15	6	10	6	5	6
Median	55	1.5	2.5	15	6	2	5.5	5	6

from as low as two to three classes at the University of New Hampshire, the University of California, the University of Wyoming, and the A. and M. College of Texas to 180 classes at the Auburn University.

The number of young farmer class sessions taught by the student teacher while doing apprentice teaching varied greatly among the institutions of the regions from a median of none in the Pacific Region to a median of 1.5 class sessions in the North Atlantic and Southern Regions. Thirteen institutions did not require their student teachers to teach young farmer classes. As many as four to five young farmer class sessions were taught by student teachers at the Kansas State University, the University of Idaho, and Auburn University.

As indicated by the data in Table 26, the number of adult farmer class sessions taught by the student teacher varied greatly among the regions from a median of none in the Pacific Region to a median of 2.5 class sessions in the Southern Region. Twelve institutions did not require their student teachers to teach adult farmer classes. Auburn University and the University of Georgia indicated that as many as six adult farmer class sessions were taught by each student teacher.

The data in Table 26 relative to the supervision of farming programs of the high school boys by the student teacher revealed a range from none at five institutions to a high of 40 boys at the Oregon State University. Wide varia-

tion existed among the regions in the number of boys supervised by student teachers. The range was from 4.75 boys in the North Atlantic Region to 15 boys in the Southern Region. Small differences were observed in the number of weeks of farming program supervision of the high school boys provided by student teachers. The time varied among the regions from 6 weeks in the Pacific and Southern Regions to 8 weeks in the North Atlantic Region.

Data concerning the number of young farmers whose farming programs were supervised by the student teacher are presented in Table 26. The number of young farmers supervised by the student teachers varied greatly among the regions from a median of none in the North Atlantic and Pacific Regions to a median of 2.5 young farmers in the Central Region. The number of weeks of supervision provided by the student teacher varied from a median of none in the Pacific Region to a median of 5.5 weeks in the Southern Region. Twenty institutions did not report any required number of weeks of young farmer farming program supervision.

In regard to the supervision of the farming programs of adult farmers by the student teacher, the data in Table 26 indicated a range from a median of none in the North Atlantic Region to a median of five adult farmers in the Southern Region. Sixteen institutions required student teachers to supervise farming programs of adult farmers. The number of

weeks of supervision of adult farmer farming programs provided by the student teacher varied among the regions from a median of none in the North Atlantic and Pacific Regions to six weeks in the Southern Region. Twenty-four institutions did not indicate any specific amount of required time for the supervision of adult farmer farming programs by student teachers.

Student teaching participation experience under the supervision of the teacher of vocational agriculture and the agricultural extension director

Data concerning student teaching participation experience under the supervision of the teacher of vocational agriculture and the agricultural extension director are presented in Table 27. All of the 43 institutions included in the investigation required student teaching participation experience under the supervision of a teacher of vocational agriculture. The Ohio State University indicated that about 8 per cent of the student teachers of that state completed apprentice teaching for 5.5 weeks with agricultural extension directors and 5 semester credits were granted the student teachers for such experience. None of the other 42 institutions required apprentice teaching under the supervision of an agricultural extension director.

The number of semester credits that the student teachers were granted for student teaching experience under the supervision of the teacher of vocational agriculture varied only

Table 27. Student teaching participation experience - number of weeks, number of credits granted, and number of hours of work per day under the supervision of vocational agriculture teacher and agricultural extension director, by region and state

Region and state	Under the supervision of vocational agriculture teacher			Under the supervision of the agricultural extension director		
	No. weeks	Semester credits granted	No. hours work per day in high school	No. weeks	Semester credits granted	No. hours work per day
A. Central Region						
Illinois	10	8	10-12	none	none	none
Indiana	5	5	6-8	none	none	none
Iowa	6-9	6-8	11	none	none	none
Kansas	6	5	10	none	none	none
Kentucky	18	9	5	none	none	none
Michigan	11	10	12	none	none	none
Minnesota	6	4	10	none	none	none
Missouri	6	6	8	none	none	none
Nebraska	8	7	8-12	none	none	none
North Dakota	5-6	6	full time	none	none	none
Ohio	5.5	5	10	5.5[a]	5[a]	
South Dakota	6	5	6	none	none	none
Wisconsin	7	7	full time	none	none	none
Median	6	6	10	0	0	0
B. North Atlantic Region						
Connecticut	7-9	7-9	10[b]	none	none	none
Delaware	8	6	7	none	none	none
Maine	8-10[c]	8-10	7-8[d]	none	none	none

[a]About 80 per cent of students take apprentice teaching for 5 1/2 weeks with agricultural extension director and 5 1/2 weeks with the teacher of vocational agriculture. Ten semester credits are granted.

[b]Varies.

[c]Required 8 weeks minimum for 8 credits. The student may elect up to a maximum of 10 weeks for 10 credits.

[d]The student is in the community full-time during this period.

Table 27. (Continued)

Region and state	Under the supervision of vocational agriculture teacher: No. weeks	Semester credits granted	No. hours work per day in high school	Under the supervision of the agricultural extension director: No. weeks	Semester credits granted	No. hours work per day
B. North Atlantic Region						
Maryland	6-6 1/2	5	All	none	none	none
New Hampshire	17	17[e]	6	none	none	none
New York	15	15	All day	none	none	none
Pennsylvania	10	10	8	none	none	none
Vermont	8	8	8-10	none	none	none
Median	8.5	8.5	8.75	0	0	0
C. Pacific Region						
Arizona	5	5	10-12	none	none	none
California	18	7	8	none	none	none
Colorado	5	6	3	none	none	none
Idaho	6	6	6	none	none	none
Montana	6	6	6	none	none	none
Nevada	6	6	6	none	none	none
New Mexico	8	8	5	none	none	none
Oregon	18	11	10-12	none	none	none
Utah	6	6	9	none	none	none
Washington	12	8	8	none	none	none
Wyoming	8	8	8	none	none	none
Median	6	6	8	0	0	0
D. Southern Region						
Alabama	12	10	10	none	none	none
Arkansas	6	5	7[f]	none	none	none
Georgia	11	10	-[f]	none	none	none
Louisiana	6	6	6	none	none	none
Mississippi	6	6	full time	none	none	none

[e]Plus 4 weeks of course work.

[f]Not reported.

Table 27. (Continued)

Region and state	Under the supervision of vocational agriculture teacher: No. weeks	Semester credits granted	No. hours work per day in high school	Under the supervision of the agricultural extension director: No. weeks	Semester credits granted	No. hours work per day
D. Southern Region						
North Carolina	12	16[g]	full time	none	none	none
Oklahoma	8	7	8	none	none	none
South Carolina	9	6	12	none	none	none
Tennessee	8	10	full time	none	none	none
Texas	6	6	10	none	none	none
Virginia	-[f]	5[h]	8	none	none	none
Median	8	6	10	0	0	0

[g]Ten credits in agricultural education; 3 in agricultural engineering; 3 in rural sociology.

[h]Including 2 weeks during summer.

slightly among the regions from a low of a median of 6 credits in the Central, Pacific and Southern Regions to a median of 8.5 credits in the North Atlantic Region. The number of credits granted for student teaching varied greatly among the institutions from 4 credits at the University of Minnesota to 16 credits at the North Carolina State College and 17 credits at the University of New Hampshire.

The number of weeks of apprentice teaching required varied slightly among the regions from a low of a median of

6 weeks in the Central and Pacific Regions to a median of 8.5 weeks in the North Atlantic Region. Eighteen weeks were required by the University of Kentucky, the University of California, and the Oregon State University. A 17-week period was reported by the University of New Hampshire.

The number of hours of work per day spent in the high school by the student teachers for apprentice teaching varied slightly among the regions from a median of 8 hours in the Pacific Region to 10 hours per day in the Central and Southern Regions. Much greater differences in the number of hours of work per day existed among the institutions. The range was from 3 hours at the Colorado State University to 10 to 12 hours at 19 institutions.

Summer experience of apprentice with a teacher of vocational agriculture and with an agricultural extension director

An inspection of the data contained in Table 28 indicated that none of the 43 institutions required student teachers to spend any time in the summer with agricultural extension directors nor were any credits indicated for such experience. The Ohio State University with 2 to 5 weeks of experience elective for 1 to 3 semester credits, the University of Arizona with 10 weeks elective with no credits granted but cash payments to the student teacher, and the Montana State University with one week elective for no credit, were the

Table 28. Summer experience required with a teacher of vocational agriculture and/or an agricultural extension director, by region and state

Region and state	With a teacher of vocational agriculture				With an agricultural extension director			
	Required		Elected		Required		Elected	
	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted
A. Central Region								
Illinois	none	none	2-3	2-3	none	none	none	none
Indiana	none	none	none	none	none	none	none	none
Iowa	none	none	3	2	none	none	none	none
Kansas	1	1	3	3	none	none	none	none
Kentucky	none[a]	none	none	none	none	none	none	none
Michigan	none	none	2	2	none	none	none	none
Minnesota	2	none	none	none	none	none	none	none
Missouri	none	none	2	2	none	none	none	none
Nebraska	none	none	none	none	none	none	none	none
North Dakota	none	none	none	none	none	none	none	none
Ohio	none	none	2-5	1-3	none	none	2-5	1-3
South Dakota	none	none	none	none	none	none	none	none
Wisconsin	none	none	none	none	none	none	none	none
Median	0	0	1	1	0	0	0	0

[a]Teacher Trainer works with beginning teacher first year on job - may be for 3 credits.

Table 28. (Continued)

Region and state	With a teacher of vocational agriculture				With an agricultural extension director			
	Required		Elected		Required		Elected	
	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted
B. North Atlantic Region								
Connecticut	none	none	none	none	none	none	none	none
Delaware	none	none	none	none	none	none	none	none
Maine	none	none	none	none	none	none	none	none
Maryland	2	2	none	none	none	none	none	none
New Hampshire	none	none	none	none	none	none	none	none
New York	none	none	none	none	none	none	none	none
Pennsylvania	none	none	2	2	none	none	none	none
Vermont	2	none	none	none	none	none	none	none
Median	0	0	0	0	0	0	0	0
C. Pacific Region								
Arizona	3 1/2	3	none	none	none	none	10	none[b]
California	none	none	1	none	none	none	none	none
Colorado	1	none	none	none	none	none	none	none
Idaho	1	1	none	none	none	none	none	none
Montana	none	none	none	none	none	none	1	none
Nevada	none	none	none	none	none	none	none	none
New Mexico	none	none	none	none	none	none	none	none

[b]Student is paid.

Table 28. (Continued)

Region and state	With a teacher of vocational agriculture				With an agricultural extension director			
	Required		Elected		Required		Elected	
	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted	No. weeks	Semester credits granted
C. Pacific Region								
Oregon	2	1	4	3	none	none	none	none
Utah	none	none	none	none	none	none	none	none
Washington	2	-[c]	none	none	none	none	none	none
Wyoming	2	2	none	none	none	none	none	none
Median	1	0	0	0	0	0	0	0
D. Southern Region								
Alabama	none	none	none	none	none	none	none	none
Arkansas	none	none	none	none	none	none	none	none
Georgia	none	none	none	none	none	none	none	none
Louisiana	none	none	none	none	none	none	none	none
Mississippi	none	none	none	none	none	none	none	none
North Carolina	none	none	1	none	none	none	none	none
Oklahoma	none	none	2	1	none	none	none	none
South Carolina	none	none	none	none	none	none	none	none
Tennessee	none	none	none	none	none	none	none	none
Texas	none	none	none	none	none	none	none	none
Virginia	2	none[c]	none	none	none	none	none	none
Median	0	0	0	0	0	0	0	0

[c]Part of student teaching.

only institutions offering such experience with an agricultural extension director.

In regard to summer experience of student teachers with teachers of vocational agriculture, the data indicated that 32 institutions did not require any summer experience nor allowed any credits for such experience. The other 11 institutions required from 1 week of summer experience for 1 semester credit to 3 to 5 weeks for 3 semester credits.

Thirty-two institutions did not offer summer experience with teachers of vocational agriculture as an elective. Nine institutions permitted the student teachers to elect summer experience work which varied from 1 to 5 weeks and the semester credits granted for such experience varied from 1 to 3 credits. Two institutions offered 1 week of summer experience as an elective but no credits were granted.

The Improvement of Curricula in Agricultural Education

In order to obtain an insight concerning the improvements made to curricula in agricultural education during the last two years, the informants were asked the following questions:

1. What major improvements have been made in your agricultural education curricula during the past two years? Please give nature and extent of these improvements.
2. Assuming that the agricultural education staff could develop a curriculum for preparing teachers of vocational agriculture and there were no limitations, such as funds, personnel or administrative regulations, what significant changes in

the present curriculum would be made? Explain the nature of such changes which you feel will be put into effect in the immediate future.

The responses to the first question, in the informants' exact words, are as follows:

A. Central Region

University of Illinois
Independent study course for honor students, 2 hours.

Purdue University
We have provided our directed teaching into two periods (one of one week - opening of high school and the other four weeks intensively in the same teaching center). Changed our special methods of teaching vocational agriculture course from a lecture course three times per week to a lecture twice per week and a three hour laboratory for student participation in planning, etc. under supervision of staff members.

The Iowa State University
Revision of content in animal science, agricultural engineering and mathematics courses.

The Kansas State University
Increased electives to enable the curriculum to be more nearly "tailor-made" for each student.

The University of Kentucky
1. Flexibility - more freedom in selection of courses by students. Closer working relations with advisors in working out schedules.
2. Students not asked to determine their special field of interest until the beginning of the junior year.
3. Professional courses moved to graduate level by most students.

The Michigan State University
None - thorough revision in 1958.

The University of Minnesota
Additional emphasis on teacher training in field of adult and young farmer education.

The University of Missouri
Revision of curriculum in agricultural education - effective September 1960.

The University of Nebraska
(No information was provided.)

The North Dakota State University
Student-teaching credits increased from 6 to 9. We are now engaged in a study of our present basic curriculum in the College of Agriculture. Changes are contemplated within the next two years. What these will be is to be determined.

The Ohio State University
Four basic curricula of the College have been approved for agricultural education majors - agriculture, agricultural science, agricultural industries, and agricultural social sciences. For each curriculum we have two options - non-teaching and teaching. This provides much opportunity to select a program to meet individual interests and needs.

The South Dakota State College
Introduced 3 credit course in Farm Shop Practices; introduced 2 credit course in Introduction to Entomology and changed the subsequent entomology course from an option between crop entomology and livestock entomology to a general entomology offering involving both crops and livestock.

The University of Wisconsin
Moved to a block semester of student teaching and increased credits for student teaching from 5 to 7 semester credits.

B. North Atlantic Region

The University of Connecticut
None in regard to agricultural education curriculum. In regard to the curriculum in technical agriculture: We are encouraging specialization. For example, some students have nearly all of their work in plant science, agricultural engineering, etc. This is done entirely through counseling - There are no specific courses or hours required.

The University of Delaware
We have made no major improvements.

The University of Maine

Student teaching period increased from 5 to 8 weeks minimum. The student teaching period changed from the last 5 weeks in the fall semester of senior year to the last half of spring semester in the senior year. Therefore, all of the academic requirements for graduation will be completed prior to the student teaching period. Required courses in the Department of Agricultural Education were reorganized and reduced from five to three courses. Agricultural education course with 2 hours, special methods in teaching agriculture with 3 hours, supervised farm practice with 2 hours, method of teaching farm shop with 2 hours and directed teaching for 5 weeks with 6 hours as they were in the old curriculum were changed to three courses in the new curriculum as: Teaching Vocational Agriculture for 4 hours, including laboratory; Directed Teaching for 8 weeks and for 8 hours; and Agriculture Education for 3 hours.

The University of Maryland

(Information was not provided.)

The University of Massachusetts

I have only been on this position one year. Recruiting students has been time consuming and represents the biggest change here.

The University of New Hampshire

None.

The New Jersey State Agricultural College

The program for preparation of vocational agriculture teachers was terminated in June 1960.

Cornell University

We have made no major changes in the last two years. We have a very large number of electives and a very flexible curriculum. Students may select from many alternatives. Great responsibility rests on the advisor and student to plan a program of studies to meet his objective in teaching and certification requirements.

The Pennsylvania State University

(Information was not provided.)

The University of Rhode Island

(Information was not provided.)

The University of Vermont

Through the initiation of a common or core freshman year, a higher caliber student is the end product since he completes many basic science requirements early in his college experience.

C. Pacific Region

The University of Arizona

1. We have started a new course in methods of teaching agriculture in college called "College Teaching of Agriculture" - for college teachers and Junior College teachers.
2. We have organized a winter short course program for county agents who wish to work towards a Master's degree in Agricultural College. We offer four 3-week short courses during the month of February for 2 weeks each. Any graduate student can earn a total of 4 credits in the 3 weeks.

The University of California

(No information was provided.)

The Colorado State University

1. Added "Principles of Education".
2. Added course in "Audio-Visual Education".
3. Provided additional flexibility in crops and livestock production areas on an elective basis.
4. On the basis of joint effort, a 3-quarter credit course "agricultural skills" was developed in the school of agriculture cooperating with the staff in agricultural education.

The University of Idaho

Increase from 4 to 6 credits for cadet teaching. Probably will be increased to 8 credits in the near future. Some emphasis being given to the training and follow-up in farm mechanics, farm motors including small gas engines and in welding.

The Montana State College

(No information was provided.)

The University of Nevada

We have gone to a system where all students in the College of Agriculture take a set of courses or 68 credits - then students specialize in areas for an additional 68 credits - I am not sure that this system is an improvement but we are going to live with it.

The New Mexico State University

1. Introductory course (2 credits) has been added in agricultural education.
2. Our teachers college has gone to a Master of Arts program in Teaching (MAT). Not necessarily an improvement but a change. 30 semester hours - 12 hours of which are advanced courses in agricultural education; the remaining 18 hours are in technical agriculture.
3. Thesis is no longer required - I do not consider this aspect an improvement.

The Oregon State University

We have instituted an intern program: This year we begin with four students, six next year, eight next year, etc. The intern must be a graduate of Agriculture (BS) or a 5th year student in Agricultural Education (may have graduated with or without certification requirements). The intern must spend a summer plus at least 6 months under contract in a local district teaching 3 periods per day. Minimum of 5 hours per week. Supervision by local Voc-Ag teacher in selected centers is provided. Intern registers for 9 term hrs. credit in addition to the 3 periods of teaching. He spends full time in community (3 periods on pay - 3 periods for credit). There is a class on campus on Saturday mornings in the technical agricultural field. Seminars may also be held in Ag. Education. State Department of Education and Teacher Training institution must visit center at least once per month and spend some time together in center.

The Utah State University

All major changes were made six years ago with several minor changes since that time.

The Washington State University

(No information was provided.)

The University of Wyoming

(No information was provided.)

D. Southern Region

Auburn University

Curriculum study has been going on in the School of Education for five years. We have added Growth & Development of School-Age Children, Foundations of Education, Evaluation and Farm Forestry. The total curriculum has been increased from 210 quarter hours to 220 quarter hours.

The University of Arkansas

1. Increased Ag. Engr. from 12 to 15 hours.
2. Added required course - Methods in Teaching Farm Mechanics.
3. Introduced orientation course in Ag.Ed. on Junior level.

The University of Florida

(No information was provided.)

The University of Georgia

(No information was provided.)

The Louisiana State University

We have increased the student teaching course from 4 to 6 semester hours and added 3 hours of English.

The Mississippi State University

Have added 3 additional semester hours in farm planning and 3 additional semester hours in farm power. No other significant changes.

The North Carolina State College

The 2nd Rural Sociology course (R.S. 321 - Introduction to Social Research, 3 hours) is an integral part of the student teaching program including community study and individual research project. This is not new, but is by far the most unique part of our program.

The Oklahoma State University

Hours of credit for student teaching was increased from 6 to 7 semester hours.

Clemson College

1. Reduction of total hours required from 150 to 144 (college wide).
2. Requiring course in agricultural policy - however, organic chemistry had to be dropped to "make room" (I'm not sure this was good).
3. Extending student teaching period from 6 to 9 weeks.
4. Being able to substitute Landscape Design for Art Appreciation (certification requirement).

The University of Tennessee

None - we are now studying the total program.

The Texas A. and M. College

(No information was provided.)

The Virginia Polytechnic Institute

Number of required quarter hours increased from 202 to 216. More basic sciences and mathematics included in the revised curriculum. Three curricula offered in School of Agriculture, namely: (1) Ag. Science, (2) Technical Ag., (3) Ag. Business. Students may elect any curriculum with a major in Ag.Ed. The Ag. Sc. curriculum includes more basic science, Tech. Ag. curriculum includes more technical agriculture, and Ag. business curriculum includes more courses in Business Department - Business Law, Accounting, Salesmanship and Advertising.

The responses to the second question concerning the changes recommended for improvement of present curricula, in the informants' exact words, are as follows:

A. Central Region

The University of Illinois

More time for student teaching. Perhaps a student teaching course in the Junior year.

Purdue University

1. We would increase the length of the student teaching period. We will do this in the next few years (6 or 8 weeks to be the length).
2. We would have an orientation course in agricultural education and additional units of special methods for post high school programs.
3. We would make possible election of summer experience for credit, and attendance at student teaching conference for credit.
4. We would institute a special credit course for farm skills experience and practice and additional course work in agricultural engineering.

The Iowa State University

1. Require 3 weeks summer training during junior year.
2. Reduce general education course requirements 3 credits. Reduce psychology credits by 3 (combine Vocational Education 204 and 426).
3. Eliminate Psychology 104.
4. Have full quarter of student teaching.
5. Have Vocational Education 423 and 424 as full quarter courses.
6. Extend curriculum to 13 quarters.

The Kansas State University

A 5-year program with more participation experience or intern-teaching.

The University of Kentucky

Teacher trainers now follow up beginning teachers their first year on the job. Perhaps extend our semester of student teaching to two semesters or follow it up by placing the student teacher in a good department for one year of apprenticeship training. He would receive close supervision from teacher trainer and would attend 6 or 8 on-campus sessions during the year to discuss phases of his training.

The Michigan State University

1. Non-credit course to remedy shortcomings in farm experience.
2. Reduce general professional education courses and increase credits in agricultural education.
3. Reduce biological sciences credit.
4. Increase free electives.

The University of Minnesota

Twelve month internship.

The University of Missouri

A five-year program.

The University of Nebraska

(No information was provided.)

The North Dakota State University

I would establish a strong follow-up program of in-service teacher training for first year students. Also would favor increasing the teaching time within any one quarter.

The Ohio State University

1. Reorganize courses throughout the University - make content more meaningful - change prerequisites.
2. Improve the quality of teaching.
3. Have a 5th year of apprentice teaching - prior to regular certification.

The South Dakota State College

An in-service course in Ag. Ed. for beginning teachers would be first. Summer experience for student teachers and more credit pre-student teaching laboratory experiences would be provided. This second improvement is imminent during the next year.

The University of Wisconsin

Within the existing limitation of 4 years under a semester system, I feel we are free to develop a program as we want it. However, if we could have a 5 year program under a quarter system, we could do two particular types of things:

1. Give a broader covering in technical agriculture, i.e., "sample" more areas as forestry, veterinary science (disease prevention, etc.), more livestock selection, meats, etc.
2. Give a broader base in humanities, social service, and mathematics.

B. North Atlantic Region

The University of Connecticut

(No information was provided.)

The University of Delaware

Require more courses in Farm Mechanics or Agricultural Engineering.

The University of Maine

None, just changed! Unless there are some changes in Bulletin #1, etc. Prepare a broad curriculum, not limited to the specific preparation of teachers. It should include extension, plus preparation (special for foreign service), other U.S. employment (S.C.S.) and (Farmers' Home Administration) then (Farm Bureau), and other Public Service areas.

The University of Maryland

(No information was provided.)

The University of Massachusetts

1. Establishing a major in Agriculture Education.
2. This will depend upon developments in vocational education pending results of the findings and recommendations of the panel of consultants. I expect we will attempt to train teachers of agriculture in specialized fields of landscaping and horticulture with 12 hours of professional education included in the curriculum. Include

more hours in Farm Management and Agriculture Economics in our program.

The University of New Hampshire
None at present.

The New Jersey State Agricultural College
(No information was provided.)

Cornell University
1. An introductory course in Agriculture Education for freshmen or sophomores. Purpose would be to provide guidance and orientation in the broad field of Agriculture Education.
2. A more intensive methods course before student teaching.
3. The greatest need we have is for courses designed to teach the technical agriculture actually needed by prospective teachers. More practical laboratory experiences along with the principles, etc.
4. Quality teaching.
5. A fifth year of training.

The Pennsylvania State University
Provisions to train specialists in Agriculture Education; example specialists in dairying, farm mechanics, horticulture, etc.

The University of Rhode Island
(No information was provided.)

The University of Vermont
More experience in conducting original research - at least to become cognizant with research methods and an appreciation of its value in teaching.

C. Pacific Region

The University of Arizona
1. We would offer more courses off campus for college credit to upgrade teachers who are presently employed.
2. We would start a farm placement program to help students gain supervised farm experience.
3. We would give more work in Agriculture Engineering - Teach courses in Electricity, Maintenance and Repair of farm machinery.
4. We would require more time in humanities - history, philosophy, etc. Our students need to know more about people and working with them.

The University of California

This would depend to a large extent on who completes this survey. For my part I would tend to put curriculum requirements into broad unit requirements where the student could select many electives from within a broad field. For example require total units in plant science, physical science, humanities etc. and not specific courses.

The Colorado State University

1. More specialization of men preparing to teach Vocational Agriculture i.e. animal production, crop production, farm management.
2. Narrowing of farm mechanics training to areas where farmers have their economic investments and then specialize the teachers more in farm power, machinery, electricity and accompanying basic skills.
3. Prepare certain teachers for adult work on a more highly concentrated basis.

The University of Idaho

Would have cadet teachers out in the field a longer period and more follow-up on first and second year instructors.

The Montana State College

1. We will be asked to include 3-4 credits of general methods to satisfy accreditation.
2. Five year curriculum or year of graduate training.

The University of Nevada

We need a wider training in the technical areas of agriculture - with our new building in agriculture mechanics we are doing a fair job in this area now. We are limited in dairy, and other phases. If there was the money I'd like to see another year in technical aspects of agriculture and basic sciences. Also about 8 weeks practice teaching rather than 6.

The New Mexico State University

1. Add more courses in agriculture education.
2. Combine undergraduate program for training agriculture education and extension personnel.
3. Initiate off campus graduate instruction (this we hope to do next year).
4. Add a course in research methods.
5. Lengthen present 8 week period for student teaching.
6. Add course in young farmer and adult farmer education.

The Oregon State University

Similar to the one described for mature students. Also: Revision of existing technical agriculture courses with some being for Agriculture Education majors only. Small classes now makes this difficult if not impossible. We have excellent cooperation from both the School of Agriculture and School of Education. Being chairman of the institutional curriculum committee also has certain advantages for Agriculture Education.

The Utah State University

1. One major change would be to provide for summer placement of student teachers for a period of about six weeks. Another change would be to add to the graduate program.
2. A minor change that will become effective this year is to require all majors in the field of Education to take a course in which the principles of vocational education will be taught. Previously Principles of Vocational Education has been taught only to Agriculture Education and Homemaking majors.

The Washington State University

(No information was provided.)

The University of Wyoming

1. More elective freedom.
2. Courses reduced to enterprise areas as compared to broad terminology covering several areas.
3. Course in Agriculture Education offered in each of the four years.
4. Marked increase in farm mechanics.

D. Southern Region

Auburn University

More Agricultural Economics. Less professional education (Foundations). We need more 3 hour agricultural courses to get a broader coverage.

The University of Arkansas

Our present program is satisfactory as to what we can do in an undergraduate program. We would like a summer experience program.

The University of Florida

(No information was provided.)

The University of Georgia

(No information was provided.)

The Louisiana State University

There will be more free electives put in effect by the next school term.

The Mississippi State University

1. Add at least six more hours of directed field experience.
2. Add three more hours of farm management.
3. Allow students to have 1/3 of technical agriculture courses as electives.
4. No changes to be made in the immediate future.

The North Carolina State College

1. An earlier experience in teaching, perhaps Junior year.
2. Additional field experiences in areas other than Vocational Agriculture.
3. Provisions for expenses for summer practice and all of the student teaching expenses.

The Oklahoma State University

An increase would be made in the number of courses developed and taught in the technical agriculture area for students preparing to teach. At the present time we have a limited number of such courses "blocked" in the semester of student teaching. They have proven quite effective!

Clemson College

Core curriculum(s) in general education and technical agriculture, cutting across departmental lines. A minimum of 18 weeks in student teaching (excluding summer experience). Institute a required September or summer experience. The summer experience is expected to materialize.

The University of Tennessee

Revise lower division or basic curriculum in agriculture.

1. Agriculture: offer 5 hours for each Animal Science, Plant Science and Social Science in Agriculture and 4 hours for Agricultural Engineering. Redesign upper division agriculture courses to utilize basic courses.
2. Agricultural Education: re-design agricultural education on-campus courses. First, offer a 5 hour course - Methods and Course Building.

Second, 5 hour course - Supervised Farming, F.F.A. and Adult work. Offer a student teaching program providing 18 hours credit.

The Texas A. and M. College
(No information was provided.)

The Virginia Polytechnic Institute
(No information was provided.)

Credits Recommended as Curricular Standards in Agricultural Education

Following the analysis of present curricula in agricultural education, the last step in the investigation was the determination of curricular standards based on recommendations made by the same persons who provided information concerning present curricula. The informants were asked what they considered to be the ideal distribution of credits among the general education, technical agriculture and professional education divisions of the curriculum and the total number of credits recommended for graduation.

Summaries of the recommendations from the various institutions included in the study are presented in Tables 29 through 34. The persons who made the recommendations were given an opportunity to make further suggestions relative to the implications of the recommended curricular standards. These suggestions have been reported in the exact words of the informants classified by state and region represented.

Credits recommended for graduation

The number of credits recommended for graduation are presented in Table 29. On a regional basis there were small differences in the number of semester credits recommended for graduation. The range was from a median of 141.5 semester credits in the Central Region to 132 semester credits in the Southern Region. The range in number of credits recommended for graduation by the institutions varied from 124 semester credits in California to 167 semester credits in Missouri.

Recommended credits in curricular divisions

The number of credits recommended in general education, as indicated by the data in Table 29, varied from a median of 54 semester credits in the North Atlantic Region to a median of 61 credits in the Central Region. The number of credits recommended varied greatly among the individual institutions from a low of 30 semester credits in Wyoming to a high of 74 semester credits in Washington.

There was some variation among the regions in number of credits of technical agriculture recommended. The range in median was from 53 semester credits in the Central Region to 56 in the North Atlantic Region. The number of credits in technical agriculture thought desirable varied greatly among the institutions from 30 in North Carolina to 78 semester credits in Mississippi.

Table 29. Recommended semester credits in general education, technical agriculture and professional education required for graduation, by region and state

Region and state	General education	Technical agriculture	Professional education	Electives	Total credits for graduation
A. Central Region[a]					
Illinois	59	50	21	0	130
Indiana	70[b]	60	18	0	148
Iowa	45	57	32	11	145
Kansas	55	77	25	0	157
Kentucky	60-74	60-68	24[c]	0	144-166
Michigan	47	53	23	10	133
Minnesota	62	53	20	0	135
Missouri	65	70	32	0	167
Nebraska	60	45	22	3	130
North Dakota	63	53	20	0	136
Ohio	60	48	20	12	140
South Dakota	70	53	20	0	143
Median	61	53	22	0	141.5
B. North Atlantic Region[d]					
Delaware	54	60	21	0	135
Maine	65	56	23	0	144
New Hampshire	45	49	31	11	136
New York	45	60	20	0	125
Pennsylvania	62-66	45	24	11	142-146
Median	54	56	23	0	136

[a]Wisconsin was excluded because recommendations were not made.

[b]Twenty of these credits should be in related science.

[c]Three to six credits should be in principles of secondary education.

[d]Connecticut, Maryland, West Virginia and Vermont were excluded because data were not provided. Massachusetts, Rhode Island and New Jersey offer no program in agricultural education.

Table 29. (Continued)

Region and state	General education	Technical agriculture	Professional education	Electives	Total credits for graduation
C. Pacific Region					
Arizona	68	50	22	0	140
California	60	60	4	0	124[e]
Colorado	53	53	24	0	130
Idaho	66	50	20	0	136
Montana	67	54	20	0	141
Nevada	58	60	18	0	136
New Mexico	66	55	36	0	157
Oregon	49	53	24	0	126
Utah	50	56	23	0	129
Washington	74	67	24	0	165
Wyoming	30	70	30	0	130
Median	60	55	23	0	136
D. Southern Region[f]					
Alabama	48	53	27	0	128
Arkansas	48	66	18	0	132
Louisiana	50	72	22	0	144
Mississippi	48	78	18	0	144
North Carolina	65	30	20	15	130
Oklahoma	50	56	21	5	132
South Carolina	50	50	25	15	140
Tennessee	51	43	24	15	133
Texas	54	60	18	0	132
Virginia	74	41	17	0	132
Median	50	54.5	20.5	0	132

[e]The credits are in terms of a five year program (including one year of post graduate work); 124 credits for graduation plus 30 credits post graduate work.

[f]Florida was excluded because data were not provided. Georgia was excluded because recommended no change over the present curriculum and added: "We do need to improve the quality of the change in the courses."

Data relative to the number of credits in professional education recommended varied from a median of 20.5 semester credits in the Southern Region to 23 credits in the Pacific and North Atlantic Regions. The range in number of credits recommended in professional education varied greatly among the individual institutions from a low of 3 to 24 semester credits in Kentucky to a high of 36 semester credits in New Mexico.

Distribution of Recommended Credits in Curricular Divisions among Curricular Areas

Credits recommended in general education curricular areas

The data in Table 30 indicate the informants recommendations concerning the best distribution of credits among the general education curricular areas of biological sciences, communications, humanities, mathematics and statistics, physical education, hygiene and military science, physical sciences, social sciences, and electives in these areas.

According to the data presented in Table 30, there was some variation in the recommendations among the regions. In biological sciences the regional medians varied from 10.25 in the Central Region to 15 in the North Atlantic Region. The number of credits in biological sciences recommended varied greatly among the institutions from 3 in Wyoming to 20 semester credits in New Mexico. The number of credits in

Table 30. Recommended semester credits in general education curricular areas required for graduation, by region and state

Region and state	Curricular area								
	Biological sciences	Communications	Humanities	Math. and stat.	Physical ed., hygiene, military science	Physical sciences	Social sciences	Electives in area	Total credits
A. Central Region									
Illinois	8	9	6	0	4	14	6	12[a]	59
Indiana	16[b]	12	6	6	8	16[b]	6	0	70
Iowa	10.5	10	4	4	4	10.5	2	0	45
Kansas	11	12	0	3	4	11	10	4	55
Kentucky	8	12	6	3	11	8-10	6	6-18	60-74
Michigan	10	8	4	3	2	6	10	4	47
Minnesota	16	10	6	4	2	11	13	0	62
Missouri	10	12	10	3	4	16	10	0	65
Nebraska	15	8	3	2	4	10	15	3	60
North Dakota	12.5	10	6	10	6	12.5	6	0	63
Ohio	10	10	10	7	3	10	10	0	60
South Dakota	13	18	4	10	6	13	6	0	70
Median	10.25	10	6	3.5	4	10.75	8	0	61

[a]Not restricted to general education.

[b]Twenty semester credits of 32 credits in biological and physical sciences should be in related science.

Table 30. (Continued)

Region and state	Curricular area: Biological sciences	Communications	Humanities	Math. and stat.	Physical ed., hygiene, military science	Physical sciences	Social sciences	Electives in area	Total credits
B. North Atlantic Region									
Delaware	16	9	0	3	6	16	4	0	54
Maine	18	12	8	0[c]	6	12	9	0	65
New Hampshire	10	9	0	3	8	12	0	3	45
New York	9	9	4	3	0	9	6	5	45
Pennsylvania	15	6.5[d]	6.5[d]	3-6	10	6-7	15	0	62-66
Median	15	9	3	3	6	12	6	0	54
C. Pacific Region									
Arizona	12	9	8	3	7	10	8	11	68
California	12	6	6	3	8	12	6	7	60
Colorado	13	0	10	3	7	10	4	6	53
Idaho	-	-	20	4	10	12	-	20	66
Montana	10	8	6	5	6	8	6	18	67
Nevada	15	2	3	8	8	4	3	15	58
New Mexico	20	12	6	3	10	12	3	0	66
Oregon	8	5	5	3	4	8	5	11	49

[c]Depends on the requirements to enter college.

[d]Thirteen credits were recommended for communications and humanities.

Table 30. (Continued)

Region and state	Curricular area: Biological sciences	Communications	Humanities	Math. and stat.	Physical ed., hygiene, military science	Physical sciences	Social sciences	Electives in area	Total credits
C. Pacific Region									
Utah	13	6	5	5	4	10	7	0	50
Washington	12	18	6	6	8	18	6	0	74
Wyoming	3	4	8	4	8	0	3	0	30
Median	12.5	6	6	4	8	10	6	7	60
D. Southern Region									
Alabama	10	7	0	3	8	10	10	0	48
Arkansas	12	12	0	6	6	12	0[e]	0	48
Louisiana	12	9	9	6	0	8	6	0	50
Mississippi	9	6	3	6	0	12	12	0	48
North Carolina	12	10	10[f]	8	0	0	10[f]	10	60
Oklahoma	10	10	3	3	4	12	8	0	50
South Carolina	10	9	3	5	5	12	6	0	50
Tennessee	8	12	6	6	5	8	6	0	51
Texas	12	12	6	6	5	5	8	0	54
Virginia	13	12	4	8	6	19	12	0	74
Median	11	10	3.5	6	5	11	8	0	50

[e]Included under agricultural economics and rural sociology.

[f]Twenty credits were recommended for both social sciences and humanities and were divided equally between the two areas.

communications recommended varied from a median of 6 credits in the Pacific Region to 10 semester credits in the Central and Southern Regions. The number of credits in communications varied among the institutions from 2 in Nevada to 18 semester credits in South Dakota and Washington.

In humanities the regional medians ranged from 3.5 in the North Atlantic Region to 6 semester credits in the Central Region. A range from none in Alabama, Arkansas, Delaware, Kansas, and New Hampshire to 20 semester credits in Idaho was found when the recommendations of the separate institutions concerning humanities were compared.

The variation in number of credits in mathematics and statistics recommended by the institutions classified by regions varied from a median of 3 in the North Atlantic Region to 6 semester credits in the Southern Region. The number of credits recommended varied among the institutions from none in Illinois and Maine to 10 semester credits in North and South Dakota.

In the area of physical education and hygiene, the regional medians varied from 4 in the Central Region to 8 semester credits in the Pacific Region should be taken. The range in number of credits of physical education, hygiene and military science recommended by the separate institutions varied from none in five states to 11 semester credits in Kentucky.

The number of credits in the physical science area

recommended by the states classified by region ranged from a median of 10 in the Pacific Region to 11 semester credits in the Southern Region. There was a wide range in the number of credits in physical sciences recommended by the separate institutions. The range was from none in North Carolina and Wyoming to 19 semester credits in Virginia.

The number of credits of social sciences recommended varied among the regions from a median of 6 in the Pacific Region to 8 semester credits in the Central and Southern Regions. Wide differences existed among the institutions in the number of credits recommended in the social sciences. The range was from none in Kansas and New Hampshire to 15 semester credits in Nebraska and Pennsylvania.

The number of credits in elective courses in general education recommended varied from a median of zero in three regions to a median of 7 semester credits in the Pacific Region. The range among individual states varied from none in 23 states to 20 semester credits in Idaho.

Credits recommended in technical agriculture curricular areas

Data in Table 31 reveal the informants' recommendations concerning the best distribution of credits in the technical agriculture curricular areas of animal science, plant and soil science, agricultural engineering, agricultural economics and rural sociology, and elective credits in these areas.

Table 31. Recommended semester credits in technical agriculture curricular areas required for graduation, by region and state

Region and state	Curricular area					
	Animal science[a]	Plant and soil science[b]	Agricultural engineering	Agricultural economics[c]	Electives in area	Total credits
A. Central Region						
Illinois	9	9	12	9	0	39
Indiana	18	15	12	9	0	54
Iowa	15	14	14	14	0	57
Kansas	12	9	16	13	27	77
Kentucky	13	10	9-12	12	16-21	60-68
Michigan	13	13	13	13	0	52
Minnesota	16.5	10	10	16.5	0	53
Missouri	24	17	15	19	0	65
Nebraska	12	12	10	10	1	45
North Dakota	17	13	13	10	0	53
Ohio	12	12	12	12	0	48
South Dakota	16.5	16.5	13	17	0	53
Median	14	12.5	12.5	12.5	0	53
B. North Atlantic Region						
Delaware	15	15	15	15	0[d]	60
Maine	6	6	15	15	14[d]	56
New Hampshire	9	19	8	7	6	49
New York	12	12	12	12	12	60
Pennsylvania	10	10	10	10	5	45
Median	10	12	12	12	6	56

[a]Including dairy and poultry.

[b]Including forestry and horticulture.

[c]Including rural sociology.

[d]Electives in animal science and/or plant and soil science.

Table 31. (Continued)

Region and state	Curricular area: Animal science	Plant and soil science	Agricultural engineering	Agricultural economics	Electives in area	Total credits
C. Pacific Region						
Arizona	15	15	14	6	0	50
California	10	10	10	10	20	60
Colorado	20	13	13	7	0	53
Idaho	10	15	12	13	0	50
Montana	13	15	18	8	0	54
Nevada	15	15	20	10	0	60
New Mexico	12	12	16	12	3	55
Oregon	14	13	12	12	2	53
Utah	13	13	16	8	6	56
Washington	12	30	16	9	0	67
Wyoming	20	20	20	10	0	70
Median	14	15	16	10	0	56
D. Southern Region						
Alabama	7	18	10	10	8	53
Arkansas	24	15	15	12	0	66
Louisiana	24	24	12	12	0	72
Mississippi	15	15	24	15	9	78
North Carolina	0	0	12	10	8	30
Oklahoma	21	17	8	10	0	56
South Carolina	9	20	9	12	0	50
Tennessee	9	11	7	7	9	43
Texas	9	16	15	20	0	60
Virginia	12	12	10.5	6.5	0	41
Median	10.5	15.5	11.25	11	0	54.5

The informants classified by regions recommended medians of 53 to 56 semester credits in technical agriculture curricular areas. The number of credits recommended in the animal science area ranged from a median of 10.5 in the Southern Region to 14 semester credits in the Central and Pacific Regions. In the area of plant and soil sciences, including forestry and horticulture, the medians ranged from 12 in the North Atlantic Region to 15.5 semester credits in the Southern Region. The number of credits recommended in agricultural engineering ranged from a median of 11.25 in the Southern Region to 16 semester credits in the Pacific Region. There was a range from a median of 10 in the Pacific Region to a median of 12 in the North Atlantic Region in semester credits in agricultural economics and rural sociology area recommended. The number of credits recommended in elective courses in technical agriculture ranged from none in three regions to 6 semester credits in the North Atlantic Region.

As indicated by the data in Table 31, one institution (North Carolina) recommended no required credits in the animal, plant, and soil science areas, but recommended 8 semester credits of electives in these areas. Three informants thought that as many as 24 semester credits should be taken in the animal science area. One informant believed that 30 semester credits should be taken in the plant and soil science area. No informant recommended less than 7

semester credits be taken in agricultural engineering area. Two informants thought that 20 and two thought that 24 semester credits in the agricultural engineering area should be required. No institution recommended less than 6 semester credits be taken in agricultural economics and rural sociology area. One informant recommended that 17 and two recommended that 19 to 20 semester credits in the agricultural economics and rural sociology area be required.

Representatives of 27 institutions did not recommend a requirement of elective courses in technical agriculture. Only one informant recommended 20 and one 27 semester credits of electives in the technical agriculture area.

Distribution of the credits recommended in plant and soil science area among crop science, soil science, forestry, and horticulture courses

As indicated previously, regional medians of 12 to 15.5 semester credits in the plant and soil science area were recommended. The informants were asked to distribute these credits among crop science, soil science, forestry, horticulture and elective courses.

The data in Table 32 indicate that the informants when classified by regions recommended a median of 3 to 6 semester credits in crop science courses be required. The number of credits recommended in soil science ranged from a median of 3 in the North Atlantic Region to 5 semester credits in the

Table 32. Distribution of the semester credits recommended in plant and soil science area among crop science, soil science, forestry and horticulture courses, by region and state

Region and state	Course area					
	Crop science	Soil science	Forestry	Horti-culture	Elec-tives in area	Total credits
A. Central Region						
Illinois	4	4	0	0	3	11
Indiana	6	3	3	3	0	15
Iowa	5	5	0	2	2	14
Kansas	3	6	0	0	0	9
Kentucky	3	4	0	3[a]	0	10
Michigan	4	5	2	2	0	13
Minnesota	5	3	0	2	0	10
Missouri	6	8	0	3	0	17
Nebraska	4	4	0	0	4[b]	12
North Dakota	7	6	0	4	0	17
Ohio	4	4	2	2	0	12
South Dakota	8	4	1	4	0	17
Median	4.5	4	0	2	0	12.5
B. North Atlantic Region						
Delaware	6	3	0	6	0	15
Maine	0	3	0	3	0	6
New Hampshire	3	7	3	6	0	19
New York	3	3	0	0	6	12
Pennsylvania	3	3	1	3	0	10
Median	3	3	0	3	0	12

[a] And/or forestry.

[b] Should be elected in agronomy.

Table 32. (Continued)

Region and state	Course area: Crop science	Soil science	Forestry	Horticulture	Electives in area	Total credits
C. Pacific Region						
Arizona	6	6	0	3	0	15
California	4	3	0	3	0	10
Colorado	7	3	0	3	0	13
Idaho	6	6	0	3	0	15
Montana	4	7	2	2	0	15
Nevada	8	4	0	3	0	15
New Mexico	0	4	0	4	4	12
Oregon	4	4	2	2	1	13
Utah	7	3	0	3	0	13
Washington	12[c]	8	4	6	0	30
Wyoming	12	8	0	0	0	20
Median	6	4	0	3	0	15
D. Southern Region						
Alabama	5	3	3	7	0	18
Arkansas	6	3	3	3	0	15
Louisiana	8	8	3	5	0	24
Mississippi	6	6	0	3	0	15
North Carolina	0	0	0	0	4[d]	4
Oklahoma	6	6	0	5	0	17
South Carolina	5	6	3	6	0	20
Tennessee	2	2	2	2	3	11
Texas	6	4	3	3	0	16
Virginia	3	5	2	2	0	12
Median	6	5	3	3	0	15.5

[c]Three credits should be in plant pathology.

[d]Eight credits were reported for plant and soil and animal science areas as electives; they were divided equally between the two areas.

Southern Region. Of the credits recommended in plant and soil science, there was a range from a median of zero in the Central and Pacific Regions to 3 semester credits in the Southern Region in the courses to be taken in forestry.

The number of credits in horticulture courses recommended varied from a median of 2 in the Central Region to 3 semester credits in the other three regions.

An analysis of the data in Table 32 indicated that two institutions (Washington and Wyoming) recommended that 12 semester credits in crop science be required. Four institutions recommended that 8 semester credits in soil science should be required. Twenty-two institutions would require no credits in forestry. Washington would require 4 and seven states would required 3 semester credits in forestry. Four institutions, Delaware, New Hampshire, South Carolina and Washington, would require 6 and Alabama would require 7 semester credits in horticulture. Six institutions would not require any credits in horticulture.

Credits recommended in professional education curricular areas

Presented in Table 33 are data concerning the credits recommended by the informants in the professional education curricular areas of agricultural education, education and psychology, and credits in elective courses in the two areas. The medians ranged among the regions from 20.5 in the Southern

Table 33. Recommended semester credits in professional education curricular areas required for graduation, by region and state

Region and state	Curricular area			
	Agricultural education[a]	Education and psychology	Electives in the area	Total credits
A. Central Region				
Illinois	18	3	0	21
Indiana	12	6	0	18
Iowa	22	10	0	32
Kansas	25	0	0	25
Kentucky	21	3	0	24
Michigan	15	8	0	23
Minnesota	20	0	0	20
Missouri	24	8	0	32
Nebraska	19	3	0	22
North Dakota	14	6	0	20
Ohio	16	4	0	20
South Dakota	16	4	0	20
Median	18.5	4	0	21.5
B. North Atlantic Region				
Delaware	18	3	0	21
Maine	17	6	0	23
New Hampshire	25	6	0	31
New York	14	6	0	20
Pennsylvania	18	6	0	24
Median	18	6	0	23
C. Pacific Region				
Arizona	17	5	0	22
California	4	0	0	4
Colorado	20	4	0	24
Idaho	20	0	0	20
Montana	16	4	0	20
Nevada	18	0	0	18
New Mexico	26	10	0	36
Oregon	18	6	0	24

[a]Including student teaching.

Table 33. (Continued)

Region and state	Curricular area: Agricultural education	Education and psychology	Electives in the area	Total credits
C. Pacific Region				
Utah	11	12	0	23
Washington	16	8	0	24
Wyoming	20	10	0	30
Median	18	5	0	23
D. Southern Region				
Alabama	20	7	0	27
Arkansas	18	0	0	18
Louisiana	22	0	0	22
Mississippi	15	0	3	18
North Carolina	14	6	0	20
Oklahoma	18	3	0	21
South Carolina	22	3	0	25
Tennessee	19	5	0	24
Texas	12	6	0	18
Virginia	13	4	0	17
Median	18	3.5	0	20.5

Region to 23 semester credits in the Pacific and North Atlantic Regions. The informants classified by region recommended a median of 18 to 18.5 semester credits in agricultural education courses. The number of credits that the informants recommended in education and psychology courses ranged from a median of 3.5 in the Southern Region to 6 semester credits in the North Atlantic Region. Only one state (Mississippi) recommended elective credits in professional education be required.

Only one institution would require as little as 4 semester credits in agricultural education courses. Two institutions (Kansas and New Hampshire) would require as many as 25 semester credits and New Mexico would require 26 semester credits in agricultural education. The range in credits in education and psychology recommended by the separate institutions ranged from none in eight institutions to 10 semester credits in three institutions (Iowa, New Mexico and Wyoming), and 12 semester credits at the Utah State University.

Distribution of credits recommended in the agricultural education area among principles and methods, and student teaching courses

According to the data presented in Table 33 the respondents when grouped by region recommended a median of 18 to 18.5 semester credits in agricultural education. The respondents were asked to recommend a distribution of these credits among principles and methods and student teaching courses. An examination of the data in Table 34 revealed that a median of 8 to 10 semester credits in principles and methods courses should be required. The median number of credits recommended in student teaching was 8 semester credits for each of the four regions.

The number of credits recommended in principles and methods courses varied among institutions from 4 to 18 semester credits. Eighteen institutions would require 10 or more

Table 34. Distribution of the semester credits recommended in agricultural education area among principles and methods and student teaching courses, by region and state

Region and state	Course area		
	Principles and methods	Student teaching	Total credits agricultural education
A. Central Region			
Illinois	9	9	18
Indiana	6	6	12
Iowa	8	14	22
Kansas	17	8	25
Kentucky	12	9	21
Michigan	5	10	15
Minnesota	16[a]	4	20
Missouri	16	8	24
Nebraska	12	7	19
North Dakota	8	6	14
Ohio	6	10	16
South Dakota	11	5	16
Median	10	8	18.5
B. North Atlantic Region			
Delaware	12	6	18
Maine	9	8	17
New Hampshire	8	17	25
New York	6	8	14
Pennsylvania	8	10	18
Median	8	8	18
C. Pacific Region			
Arizona	9	8	17
California	4	0	4
Colorado	14	6	20
Idaho	14	6	20
Montana	10	6	16
Nevada	10	8	18
New Mexico	18	8	26
Oregon	10	8	18

[a]At least 9 credits in adult and young farmer education.

Table 34. (Continued)

Region and state	Course area: Principles and methods	Course area: Student teaching	Total credits agricultural education
C. Pacific Region			
Utah	5	6	11
Washington	8	8	16
Wyoming	12	8	20
Median	10	8	18
D. Southern Region			
Alabama	10	10	20
Arkansas	13	5	18
Louisiana	16	6	22
Mississippi	6	9	15
North Carolina	4	10	14
Oklahoma	11	7	18
South Carolina	10	12	22
Tennessee	7	12	19
Texas	6	6	12
Virginia	7	6	13
Median	8.5	8	18

credits. The number of credits of student teaching recommended also varied greatly among the institutions from none in California to 17 semester credits in New Hampshire. Student teaching in California is a part of the fifth-year program.

Recommendations Concerning Preservice Curricular Standards

In addition to the recommendations concerning ideal preservice curricular standards, the informants were asked to answer the following question:

1. Please list other suggestions concerning standards for undergraduate curricula in agricultural education.

Some informants did not respond to this question and therefore their states were excluded. Those who responded are mentioned below according to region and state as follows:

A. Central Region

Purdue University

Courses whenever possible should be set up and taught especially to meet the needs of teachers of agriculture - not specialists in the special area.

The Iowa State University

Ideal agricultural education majors should have at least three years of vocational agriculture experience in high school.

The University of Kentucky

Early detection of speech and hearing defects and corrected if possible before approval for teacher education. Closer screening of students with regard to attitudes, aptitude, vocational intention and English and math competence.

Place in the curriculum:

1. Foundations of American education
2. Agricultural education regarding its effect on our society and economy and people employed in agriculture
3. School organization

The Michigan State University

Fit the program to the student and his needs. It is impossible to give in four years what all the "experts" think should be required. Leave certain courses for graduate work.

B. North Atlantic Region

The University of Connecticut

I believe in a fluid situation which provides for the development of a range of competencies in line with the student's interests and abilities. This is the nature of the present program.

Cornell University

Determine that which the teacher will do and then plan a curriculum to meet his needs. In other words make an analysis of what a teacher should know and be able to do. Then set up a curriculum to meet his needs. Generalizations do not fit beef cattle farming areas or dairy areas or other types of farming. Agriculture will vary from state to state or region to region.

The Pennsylvania State University

Pennsylvania is quite different from most. Each state needs agricultural teachers with certain technical agricultural training. We need in Pennsylvania men well-trained in dairy. I see a need for us to train specialists in horticulture (nursery and landscape work). In conclusion, I don't think we do a very good job in four years. We could use five.

C. Pacific Region

The University of Arizona

Our students need to know more about people - working with them, etc. They have adequate competency in agriculture for beginning teachers. (By adequate, I mean as much as they need to know to start - they will, of course, need to learn a great deal more agriculture for the specific needs of the community in which they go to teach.)

The Colorado State University

1. Considering the complexity of the job of teaching vocational agriculture, it is likely that consideration should be given to a five-year curriculum in order to adequately train teachers

of vocational agriculture for the job ahead.
2. Greater emphasis in training will need to be devoted to competencies in the area of farm management.
3. More emphasis will need to be devoted to training teachers for adult and young farmer class teaching.

The University of Nevada

I don't believe setting a number of courses for students to take necessarily does the job. I believe we will be pushed into far more technical courses and less practical courses as time goes on. I am not sure we need more courses but better ways of getting high quality students into agricultural teaching. We in Nevada need to find a way to assist the practice teachers when they are out on the job.

The Utah State University

Agricultural Education majors should take more in about every area in agriculture, but there is a limit to the amount of credit they can carry in four years. If a fifth year were added without adding other incentives, it would tend to drive many worthy teaching candidates into fields other than teaching fields or into teaching fields other than agriculture.

D. Southern Region

The University of Georgia

A student should have maintained a C+ average in Education courses before he is permitted to do student teaching.

The Mississippi State University

Quality work essential.

The North Carolina State College

You indicate no emphasis on research, doing or using, at undergraduate level. We think this is essential, therefore, we emphasize research approach and provide students with opportunity to do research.

If you provide opportunity for Agriculture Extension practice, why not SCS, FHA, Commercial?

DISCUSSION

From the results of this study, it was apparent that a need exists for guidance courses in agricultural education curricula. The present society is complicated and students need help from personnel trained in the field of guidance. The vocational agriculture teacher should have training in order to provide adequate guidance to boys and farmers in his classes. The teacher training institutions should consider adding a course which would include principles and practices of guidance in order to equip the teacher of vocational agriculture with a better understanding of counseling and guidance techniques.

In the summary of courses in biological sciences, the investigator recognized the difficulty encountered by several institutions in categorizing biology, botany, and zoology. In a few instances, universities reported having required courses in biology but no work in botany or zoology. It may be inferred in these instances that the biology courses included work in botany and zoology. Considerable variation existed among the institutions in the amount of work required in the biological sciences. Botany was required by 33 institutions and 27 universities required specific work in zoology. Five of the institutions required course work in biology. The problem of classification also was evident in reporting courses in genetics. Several courses may have included work

in this area but only 12 institutions required specific courses in genetics.

Nine institutions did not require any mathematics as a specific requirement of all agricultural education majors. In the modern age, mathematics is a basic course which is essential in almost every occupation and should be included as a part of the training for teachers of agriculture. With the high capital investments necessary in the field of agriculture, the need for a basic knowledge of mathematics is apparent. Certainly this is true for the student who plans to teach scientific agriculture in the modern high school.

Additional work should also be required in the area of farm accounting and business analysis which was required by only seven institutions. Farm management should be a part of the training offered by all institutions. It is in this area that great strides toward improving the efficiency of farming businesses may be made. Only 31 institutions required specific work in the area of farm management and organization.

Twenty-eight institutions required specific work in principles of economics. Agricultural finance was required by only three institutions and it is felt that due to the importance of this subject, additional work might be considered. Additional work in agricultural marketing might also be desirable as only 13 institutions required specific courses in this

area.

It is felt that specific work in rural sociology might be considered. Only six institutions required specific work in rural sociology. Rural sociology is important due to its value in acquainting the prospective teacher of vocational agriculture with the community where he will be teaching and living.

The investigator found that specific courses required in methods of teaching young and adult farmers were rather low. Only 22 of the 43 institutions required such courses. More emphasis should be placed in the area of adult education in order to adequately prepare the prospective agriculture teacher. Some attention may have been given to methods of teaching adults and young farmers in other methods courses.

Due to present trends in scientific agriculture, mechanization and automation, more courses in agricultural engineering should be required. Perhaps a narrowing of farm mechanics training to specific areas in agricultural engineering would be desirable. This would mean training specialists in farm electricity, machinery and power, irrigation, farm buildings and equipment and in the other specific areas of farm mechanics.

Farm machinery, a fundamental course in the area of farm mechanics, was required by 25 institutions. Another important course, tractor power, was required by only 15 institutions.

It may be desirable to expand the work required in these areas. It was also observed that the requirement of a farm electricity course by the various institutions was rather low. Only six institutions required such a course.

All institutions required specific work in one or more courses in soils. Forty institutions required specific courses in basic soil science. Due to the importance of fertilizers and soil management it is recommended that additional courses be considered in the area of soil conservation and erosion control as well as in soil fertility and management.

Only 26 institutions required specific work in crop production. A specific course in forage crops was required by 14 institutions and it is believed that more required work may be a possibility in this area. Additional emphasis on principles of crop breeding might be considered as only three institutions required course work in this area.

All institutions required specific work in animal nutrition which included livestock feeds and feeding. Animal sanitation and disease control courses were required by only three institutions. Increased emphasis in this area is desirable. Very few courses were required in livestock selection and judging as only five institutions required such courses. Specific courses in principles of livestock breeding were required by only five institutions. It is possible that these

areas were adequately considered in other more general courses.

All institutions were low in the number of specific courses required in the area of livestock enterprises. Only 24 institutions required specific work in poultry production and management. The same number of institutions required courses in dairy cattle production. None of the universities required specific courses in the important areas of swine production and marketing, or sheep production and marketing. Only one institution required work in beef cattle production and marketing.

Specific required work in horticulture was relatively low. Only 16 institutions required work in general horticulture, yet fruits, vegetables, flowers and landscape plantings may be found on nearly every farm. Five institutions required specific work in vegetable crops and four universities required courses in landscaping.

In the area of communications, 31 institutions required work in speech. Basic communications and English were required by all universities included in this study. A specific course in journalism was required by only eight institutions yet writing news articles and public relations activities are important parts of the vocational agriculture teacher's job. In the main, the curricula in agricultural education was found to be rather weak in the area of the humanities,

art, music and in history.

In the area of physical sciences, all but three institutions required specific courses in chemistry. Physics courses were required by 14 schools as a part of the agricultural education curriculum. It is felt that physics is a fundamental course in the training of future teachers of vocational agriculture and more emphasis should be placed in this area.

Educational psychology was required by 31 institutions. Four institutions required specific work in history of American education. It is believed that work in principles of secondary education is essential for all prospective teachers, yet only 16 universities required course work in this area. The subject matter normally included in these courses may have been included in other courses.

Due to the vast amount of training needed by prospective teachers of vocational agriculture, it is impossible to give in four years all the training that is needed. A recommendation of a five-year program seemed to be the trend and was recommended by nine of the 43 institutions studied. There appeared to be a trend toward more subject matter specialization for prospective teachers of vocational agriculture with increased credits in one or more of the following areas: animal production, crop production, soils, farm management, and farm mechanization.

Large differences were found among universities concern-

ing the length of the present student teaching period with a range of from 5 to 18 weeks. Twelve teacher trainers would lengthen the time spent in apprentice student teaching. A wide variation existed in the amount of additional time recommended to be spent in student teaching. Recommendations ranged from 2 to 30 additional weeks.

Vocational agriculture teachers are hired and work on a yearly basis, yet rarely does a trainee get any experience or training which would prepare him for the summer portion of his job. Some type of training should be instituted whereby future teachers can gain experience and background in summer activities. Additional courses could be added to the curriculum which would include training in this area, or specific portions of existing courses should be devoted to summer employment if provision is not presently being made for this training. Summer work experience with a competent teacher of vocational agriculture, or perhaps a portion of the student teaching experience should be done during the summer months. Such experience should be considered desirable and a range of 3 to 6 weeks were recommended.

A need exists for further investigation which would include a comprehensive examination of course content. According to respondents many courses are outdated and do not meet the needs of modern scientific agriculture. Quality of course content is essential. Many courses are being taught which

have not kept pace with the rapid changes in technical agriculture. These courses may be revised to meet the increasing needs of the modern vocational agriculture instructor. In this study an attempt was made to examine and analyze the curricular status from the standpoint of the total number of credits that were required in each curricular division, curricular area, and course area and the emphasis being placed in specific required courses, prescribed elective courses, and free elective courses. A similar attempt was made to discover what the informants thought was an ideal curriculum for their own institution including their suggestions and recommendations concerning the improvement of the present curriculum.

The findings of this study indicate, in general, that there were not large differences between the present curricular requirements in the 43 institutions and the curricular standards recommended by the representatives of the individual institutions. There was a slight trend toward more credits being required for graduation than are now prescribed. On a regional level, it was found that the median number of semester credits required for graduation in the present curricula ranged from 133 to a high of 143 credits. This was in comparison with a range of 132 to 141.5 credits which were thought to be desirable as curricula standards.

Large differences were found among the individual insti-

tutions in the number of credits now required in the present curriculum and the number recommended in future curriculum. The number of credits required varied from a low of 120 to a high of 158 semester credits in the present curriculum, to a low of 124 and a high of 167 semester credits in recommended curricula.

The investigator, after having analyzed the curricula, firmly believes that the number of courses and credits which should be required is not necessarily the most valuable criterion in determining the adequacy of preparation of prospective teachers of vocational agriculture. The investigator is in full agreement with the informants' points of view concerning the importance of quality teaching and quality of course content in evaluating agricultural education curricula.

It is believed that the results of this study might serve as a guide for future planning of agricultural education programs across the nation. It is hoped that the agricultural departments might be able to more adequately plan curricula to meet the needs of prospective teachers of vocational agriculture.

SUMMARY

The primary purpose of this investigation was to analyze the curricula in the agricultural education of the various land-grant colleges and state universities to determine similarities, differences, innovations and trends in general education, technical agriculture and professional education courses and credits required, and the obtaining of recommendations for the improvement of future programs.

Originally 48 institutions were included for this investigation. Responses from Rhode Island, New Jersey and Massachusetts indicated that these states had no teacher education curricula in agricultural education. No responses were received from head teacher trainers in agricultural education in Florida and West Virginia. Therefore, the study was limited to 43 states. Of the 43 institutions studied, 13 were located in the Central Region, eight in the North Atlantic Region, 11 in the Pacific Region, and 11 in the Southern Region.

The data used in the study were in the main obtained from questionnaires returned by the heads of the departments of agricultural education or from staff members selected by the heads of the departments to provide the information. In some instances college catalogues were used to clarify information.

The informants proposed some change in the number of semester credits required for graduation. On a regional basis, they recommended that a median of 132 to 141.5 credits be

required for graduation. This was in comparison to 133 to 143 credits being required in present curricula. On the individual institutional level, the number of credits recommended varied greatly from 124 to 167 credits. This was in comparison to 120 to 158 credits that were required in present curricula.

The informants favored no major changes in the numbers of semester credits now required in the curricular divisions. On a regional level the total number of credits in a general education division thought most desirable ranged from a median of 50 to 61. This was in comparison to a median of 56.5 to 59 credits in present curricula. Among the individual institutions much greater differences were found. The recommended number of credits varied from 30 to 74 while the number of credits in the present curricula ranged from 46 to 75.

In the technical agriculture division, it was found that on a regional basis the informants proposed a median of 53 to 56 semester credits should be required. This was in comparison to a median of 55 to 58 credits required in present curricula. The number of credits in the technical agriculture division varied among the individual institutions from 30 to 78 credits as curricula standards. A range of 35 to 67 credits were required in present curricula.

The recommended change in number of semester credits in professional education was very small. On a regional level, it was recommended that a median of 20.5 to 23 credits should be required. This was in comparison to 21 to 26 credits

required in the present curricula. Large variations were found among the individual institutions. A range of 4 to 36 credits was recommended and a range of 15 to 38 credits was found being required in present curricula.

The number of credits in specific courses required of all agricultural education majors in the curricular areas of a general education division varied greatly among the institutions in both recommended curricula and present curricula. Much less variation was found among the medians for the various regions.

In the biological science area, a median of 10.25 to 12.5 semester credits was recommended. This was in comparison to a median of 7.5 to 13 credits required in present curricula. The variation among the institutions was from 3 to 20 credits recommended and from none in four institutions to 17 to 18 credits required in present curricula.

In the communications area the informants proposed a regional median of 6 to 10 semester credits. This was in comparison to a regional median of 8 to 10 credits required in present curricula. The number of credits varied greatly among the institutions from none to 18 credits recommended and none to 15 credits in present curricula.

The number of semester credits in the humanities area believed most desirable varied among the regions from a median of 3 to 6 credits. There was a range from none to 3 credits required in present curricula. Large differences were found

among the institutions. The recommendations ranged from none to 20 credits whereas none to 15 credits were required in present curricula.

The informants proposed that a regional median of 3 to 6 semester credits should be required in the mathematics and statistics area. This was in comparison to a median of 1.5 to 3 credits being required in present curricula. Great variation existed in the number of credits required by various institutions. The number of credits varied from none to 10 recommended and from none to 9 being required in present curricula.

In the physical science area the informants in the various regions believed that a median of 10 to 11 semester credits should be required. This was in comparison to a median of 8 to 11 credits required in present curricula. Wide variations were found among the individual institutions in both the recommended and the present curricula. A range of none to 19 credits was recommended and none to 19 credits were being required in present curricula.

The informants recommended a median of 6 to 8 semester credits in the social science area. This was in comparison to a median of 3 to 6 credits required in present curricula. The number of credits varied greatly among the institutions from none to 15 credits recommended and from none to 15 credits required in present curricula.

It was recommended that the number of semester credits

in agricultural economics and rural sociology be increased. The median number of credits varied from 10 to 12.5. This was in comparison to medians ranging from 6.3 to 9 credits required in present curricula. The range among the institutions varied from 6.5 to 19 credits recommended and from 0.7 to 15 credits presently required.

In the agricultural engineering area the informants recommended a significant change in the number of semester credits required. They proposed regional medians of 11.25 to 16 credits of required work. This was in comparison to medians of 8.5 to 12 credits now required. The number of credits recommended by the individual institutions varied widely from 7 to 27 credits and from 2 to 17 credits now required.

In the dairy and animal science area, the informants recommended regional medians ranging from 10 to 14 semester credits. This was in comparison to medians ranging from 3 to 6.6 credits required in general animal science, none to 3.5 credits required in dairy science, and none to 3 credits presently required in livestock enterprises. Wide differences were found among the various institutions in the number of credits recommended and required. The range varied from none to 24 credits required in recommended curricula, and from 2 to 14 credits in general animal science, none to 7 credits in dairy science, and none to 7.3 credits in livestock enterprises required in the present curricula.

In the crop science area the informants recommended

medians of 3 to 6 semester credits of required work. Medians of 3 to 4 credits were required in the existing curricula. The number of credits recommended varied greatly among the institutions from none to 12 credits. None to 14 credits were required in present curricula.

The recommended number of credits in soil science varied among the regions from a median of 3 to 5 semester credits. This was in comparison to medians of 3 to 4 credits required in present curricula. Wide variations in the number of credits recommended and required existed among the various institutions. The range was from none to 8 credits for both the recommended and the present curricula.

The informants recommended a range of none to 3 semester credits in forestry. This was in comparison to medians of none to 2 credits required in present curricula. Much variation in the number of credits recommended and required existed among institutions. The recommendations ranged from none to 4 credits, whereas none were required in 31 institutions and 6 credits was the maximum number required.

The informants from the four regions recommended medians of 2 to 3 semester credits of horticulture be required. This was in comparison to medians of none to 3 credits being required in present curricula. Wide differences were found among the individual institutions. The range in number of credits recommended varied from none to 7, whereas the number

required at present ranged from none in 18 institutions to 10 credits.

A slight increase in the number of semester credits in agricultural education was recommended. The informants recommended regional medians of 18 to 18.5 credits. Medians of 15 to 16 credits were found to be required in present curricula. There were wide variations in the number of credits recommended and required among the individual institutions. The recommendations varied from 4 to 26 and the number of credits in present curricula varied from 7 to 25 credits.

In the education and psychology area the informants recommended medians ranging from 3.5 to 6 semester credits. This was in comparison to medians of 3 to 6 credits required in present curricula. The number of credits recommended and required varied widely among the institutions. From none to 12 credits recommended and none to 17 credits required in present curricula were the ranges.

The total semester credits in specific courses required of all agricultural education majors varied among the regions from a low median of 101.75 credits in the North Atlantic Region to a high median of 108 credits in the Southern Region. The number of credits varied widely among the various institutions from a low of 32 to 42 credits at the University of Connecticut to a high of 146 credits at Auburn University.

The total number of semester credits of prescribed

elective courses in the present curricula varied greatly among the regions from a median of 5 credits in the Southern Region to a median of 27.5 credits in the North Atlantic Region. The number of credits required in prescribed electives also varied widely among the institutions from none at nine institutions to a high of 58 credits at Cornell University and 55 to 74 credits at the Ohio State University.

The total semester credits of free elective courses required in the present curricula varied from a median of 5 credits in the Pacific Region to a median of 10.5 credits in the North Atlantic Region. The variations among the institutions ranged from none at seven institutions to a high of 29 credits at the University of Arkansas and 23 to 38 credits at the University of Vermont.

The number of years of farm experience after 14 years of age required of candidates for entering the curricula in agricultural education varied among the institutions from one to four years. Four institutions did not require this experience. Over one-half of the institutions required two years of farm experience after the age of 14 years as a qualification for entry in the curricula.

Vocational agriculture in high school was not required by any of the 43 institutions in order for the student to enter the agricultural education curriculum.

The grade point average required for students to enter

the agricultural education curriculum varied greatly among the institutions from none at 12 institutions to 2.3 or more in 16 institutions.

The use of aptitude and achievement tests by institutions in selecting agricultural education candidates was not being done in 22 institutions. Six institutions used the Strong Interest and Vocational Test and the College Board Test. Eight institutions required a test in English language.

It appeared that in 18 institutions the candidates declared agricultural education as their major field when they were freshmen. In 12 institutions the candidates indicated their major in the sophomore year. In 14 institutions students entered the curricula at the start of the junior year. In six institutions the students declared their major during the senior year.

The results of the study concerning student teaching participation experience indicated that the median number of high school classes taught by the student teachers in the various regions varied from 40 class sessions in the North Atlantic Region to 60 class sessions in the Pacific Region.

The number of young farmer class sessions taught by the student teacher while doing student teaching varied greatly among the institutions of the regions from a median of none in the Pacific Region to a median of 1.5 class sessions in the North Atlantic and Southern Regions. Thirteen institu-

tions did not require their student teachers to teach young farmer classes.

The number of adult farmer class sessions taught by the student teacher varied greatly among the regions from a median of none in the Pacific Region to a median of 2.5 class sessions in the Southern Region. Twelve institutions did not require their student teachers to teach adult farmer classes.

The results of the study concerning the supervision of farming programs of high school boys by the student teachers revealed a wide variation existed among the regions in the number of boys supervised by student teachers. The range was from 4.75 boys in the North Atlantic Region to 15 boys in the Southern Region. The number of weeks of farming program supervision of the high school boys provided by the student teacher varied from six weeks in the Pacific and Southern Regions to eight weeks in the North Atlantic Region.

The number of young farmers whose farming programs were supervised by the student teacher varied greatly from a median of none in the North Atlantic and Pacific Regions to a median of 2.5 young farmers in the Central Region. Twenty institutions did not report any required number of weeks of young farmer farming program supervision. The number of weeks of supervision provided by the student teacher in the other institutions varied from a median of none in the Pacific Region to a median of 5.5 weeks in the Southern Region.

The supervision of the farming programs of adult farmers by the student teachers ranged from a median of none in the North Atlantic Region to a median of five adult farmers in the Southern Region. Twenty-three institutions did not require the student teacher to supervise farming programs of adult farmers. The number of weeks of supervision of adult farmer farming programs provided by the student teacher varied among the regions from a median of none in the North Atlantic and Pacific Regions to six weeks in the Southern Region.

All of the 43 institutions included in the study required student teaching participation experience under the supervision of teachers of vocational agriculture. Forty-two of the 43 institutions did not require student teaching under the supervision of an agricultural extension director. The number of credits granted for student teaching varied slightly among the regions from a median of 6 semester credits in the Central, Pacific and Southern Regions to a median of 8.5 semester credits in the North Atlantic Region.

The number of weeks of student teaching required varied slightly among the regions from a median of six weeks in the Central and Pacific Regions to a median of 8.5 weeks in the North Atlantic Region.

The number of hours of work per day spent in the high school by the student teachers varied among the regions from a median of eight hours in the Pacific Region to ten hours

per day in the Central and Southern Regions.

None of the 43 institutions required student teachers to spend any time in the summer with agricultural extension directors, nor were any credits indicated for such experience. Such experience was offered by three institutions as an elective for either cash payments to the student teacher or for credits ranging from none to 3 semester credits.

Thirty-two institutions did not offer summer experience with teachers of vocational agriculture. Eleven institutions required or permitted the student teachers to take summer experience work which varied from one week for 1 credit to three to five weeks for 3 semester credits.

In the main the curricula in agricultural education were adequate in 35 or more of the 43 institutions studied in the areas of animal nutrition, basic soils, botany, basic communications, chemistry, directed student teaching, and methods of teaching vocational agriculture in high school.

In summary, the weaknesses that were found in the present curricula and the recommendations of the respondents to improve curricula in agricultural education appear to justify the following recommendations:

1. Place greater emphasis and provide more work in the following areas:
   a. Farm management, farm accounting and business analysis, agricultural finance and agricultural marketing.

b. Maintenance and repair of machinery, farm electricity, farm buildings and equipment, farm machinery and tractor power, and methods of teaching farm mechanics.

c. Soil management, conservation and erosion control, and fertilizers.

d. Crop production, forage crops, crop management, and principles of crop breeding.

e. Horticulture crops and landscaping.

f. Farm forestry.

g. Animal science including swine, beef, poultry, and sheep production and marketing, dairy, and animal sanitation and disease control.

h. Biological science courses related to plant disease and insect control, and genetics.

i. Communications particularly journalism.

j. Humanities including history and philosophy.

k. Mathematics with emphasis on basic college mathematics and algebra.

l. Physical science particularly physics.

m. Professional education courses in the areas of methods of teaching young and adult farmers, practice in farm skills, summer experience, counseling and guidance techniques, and principles of secondary education.

2. Improve the quality of teaching and the content of courses.

3. Emphasize practical courses for prospective teachers and off-campus courses to up-grade teachers who are presently employed.
4. Provide flexibility in the selection of courses by students particularly in fields of technical agriculture.
5. Provide for greater specialization in fields of technical agriculture.
6. Lengthen the period of supervised student teaching.
7. Establish a more intensive follow-up program of beginning teachers.
8. Organize original research programs in order for undergraduates to gain experience in using research methods and in using results of research in teaching.
9. Initiate or expand programs of summer experience for prospective teachers of vocational agriculture.
10. Improve the methods used in selecting prospective vocational agriculture teacher candidates.

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APPENDIX A. PERSONS WHO PROVIDED THE INFORMATION AND THE LOCATION OF INSTITUTIONS INCLUDED IN THE STUDY

	Name of institution	Name of person who provided the information
Central Region		
Illinois	University of Illinois	Lloyd J. Phipps
Indiana	Purdue University	E. E. Clanin
Iowa	Iowa State University	Clarence E. Bundy
Kansas	Kansas State University	R. J. Agan
Kentucky	University of Kentucky	Carl F. Lamar
Michigan	Michigan State University	Harold M. Byram
Minnesota	University of Minnesota	Stanley W. Nelson
Missouri	University of Missouri	C. V. Roderick
Nebraska	University of Nebraska	Howard W. Deems
North Dakota	North Dakota Agricultural College	Strubel O. Owen
Ohio	Ohio State University	Ralph E. Bender
South Dakota	South Dakota State College	H. W. Gadda
Wisconsin	University of Wisconsin	Walter T. Bjoraker
North Atlantic Region		
Connecticut	University of Connecticut	W. H. Martin
Delaware	University of Delaware	Ralph P. Barwick
Maine	University of Maine	Wallace H. Elliott
Maryland	University of Maryland	V. R. Cardozier
Massachusetts	University of Massachusetts	Robert C. Jones
New Hampshire	University of New Hampshire	Phillips S. Barton
New York	Cornell University	C. W. Hill
Pennsylvania	Pennsylvania State University	David R. McClay
Vermont	University of Vermont	Bruce A. Gaylord
Pacific Region		
Arizona	University of Arizona	John R. Williams
California	University of California	S. S. Sutherland and E. M. Juergenson
Colorado	Colorado State University	R. W. Canada
Idaho	University of Idaho	H. A. Winner
Montana	Montana State College	Leo L. Knuti
Nevada	University of Nevada	Howard H. Christensen
New Mexico	New Mexico State University	J. D. McComas
Oregon	Oregon State University	Henry TenPas
Utah	Utah State University	Stanley S. Richardson

Pacific Region		
Washington	Washington State University	E. W. Webb
Wyoming	University of Wyoming	Jack Ruch
Southern Region		
Alabama	Auburn University	R. W. Montgomery
Arkansas	University of Arkansas	Denver B. Hutson
Georgia	University of Georgia	R. H. Tolbert
Louisiana	Louisiana State University	Morris N. Abrams
Mississippi	Mississippi State University	O. L. Snowden
North Carolina	North Carolina State College	C. C. Scarborough
Oklahoma	Oklahoma State University	Robert R. Price
South Carolina	Clemson College	Lowery H. Davis
Tennessee	University of Tennessee	George W. Wiegers, Jr.
Texas	Texas A. and M. College	Earl S. Webb
Virginia	Virginia Polytechnic Institute	Evans G. Thompson

APPENDIX B. CORRESPONDENCE IN CONNECTION WITH THE STUDY

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Ames, Iowa

Department of Vocational Education

November 30, 1961

I would appreciate very much your cooperation in providing the information requested on the enclosed questionnaire. I am working on a doctorate program at the Iowa State University and have selected as the topic of my dissertation, "Curricula in Agricultural Education at the Land-Grant Colleges and State Universities in the United States". I am doing my research under the direction of Professor C. E. Bundy.

I hope to discover the similarities and the differences among the undergraduate programs in agricultural education at the various land-grant institutions and the emphasis placed on technical agriculture, general education and professional course areas in the various curricula. Information will be obtained concerning (1) changes in teacher education programs that have been made during the past two years, and (2) curriculum standards that should be met in planning future programs in agricultural education.

The results of this study should contribute to the improvement of the pre-service curricula in agricultural education. Enclosed you will find a self-addressed, stamped envelope for your convenience in returning the completed questionnaire. Your prompt reply will be very much appreciated. It is my hope to have the returned questionnaires coded and the information placed on IBM cards by January 1. Thank you kindly.

Sincerely yours,

(Signed) Salim H. Jabro

Salim Jabro
Graduate Student
Agricultural Education

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Ames, Iowa

Department of Vocational Education

January 30, 1962

I am writing in regard to the questionnaire and request for information which I mailed you December 1, 1961. To date, I have not heard from you. I have received replies from forty-three of the forty-eight institutions cooperating in my study of "Curricula in Agricultural Education at the Land-Grant Colleges and State Universities in the United States".

I believe that we may all make a real contribution to the Agricultural Education curriculum by assisting in this study. I also believe that you are aware of the fact that I am depending upon the cooperation of the qualified men in the field to provide the data.

I should like to begin my study before February 15, 1962. I am looking forward to hearing from you before this date, if possible please.

I am enclosing a second questionnaire with self-addressed stamped envelope for your convenience in case the first one may have been misplaced or lost in the mail.

Again I say, that I greatly appreciate your cooperation and your prompt completing and returning the questionnaire. Thank you kindly.

Very sincerely yours,

(Signed) Salim H. Jabro

Salim Jabro
Graduate Student
Agricultural Education

APPENDIX C. QUESTIONNAIRE SENT TO HEAD TEACHER TRAINERS IN FORTY-THREE INSTITUTIONS

CURRICULA IN AGRICULTURAL EDUCATION AT LAND-GRANT COLLEGES AND STATE UNIVERSITIES IN THE UNITED STATES

Completed form to be mailed first class in the enclosed envelope to:

Mr. Salim Jabro
Vocational Education Department
Iowa State University of
Science and Technology
Ames, Iowa

Name of Institution_____

Name of Person Providing Information_____

Date_____

Do you wish a summary of this study when it is completed? Yes_____ No_____

Explanations

For the purpose of this study, please consider the curricular divisions to include the courses according to the following designations:

1. General Education

Any course taught primarily for all students in the college and/or university regardless of their major or field of specialization, should be considered as a general education course. General education is considered, in this study, as that education desirable for all citizens regardless of occupation or profession.

A. Biological Sciences
- Bacteriology
- Biology
- Botany
- Entomology
- Genetics
- Physiology
- Zoology

B. Communications
- English Composition
- Journalism
- Literature
- Speech
- Using Radio, TV

C. Humanities
- Art
- Foreign Language
- History
- Library
- Logic
- Music
- Philosophy

D. Mathematics and Statistics
- Calculus
- College Algebra
- Statistics
- Trigonometry

E. Physical Education and Military
- Hygiene
- Military Science
- Physical Education

F. Physical Sciences
- Astronomy
- Chemistry
- Geology
- Physics

G. Social Sciences
- Economics
- Geography
- Government
- Political Science
- Psychology, General
- Sociology

2. Professional Courses

Any course which has as its primary objective the assisting of students to become more proficient in teaching, exclusive of courses in technical agriculture and in general education, should be considered a professional education course. These courses may be taught by members of the College of Education staff, by members of the Department of Agricultural Education faculty or by members of the Psychology Department.

3. Technical Agriculture

Any course taught by members of the faculty in the College of Agriculture or College of Engineering primarily for students majoring in agriculture, should be considered as a technical agriculture course. They include:

A. Animal science, including dairy and poultry,
B. Plant and soil science, including crops, soils, forestry and horticulture,
C. Agricultural mechanics and engineering, and
D. Agricultural economics and rural sociology, including farm management, marketing, and finance

1. The Curriculum in Agricultural Education

Answers are expressed in ____quarter credits,____semester credits, (check one)

CURRICULAR DIVISIONS	(1) TOTAL CREDITS OF REQUIRED COURSES (INCLUDING ALL SPECIFIC COURSES WHICH MUST BE TAKEN BY ALL AGRICULTURAL EDUCATION MAJORS) THE STUDENT MUST COMPLETE THEM. HE HAS NO CHOICE IN THE MATTER.	(2) TOTAL CREDITS REQUIRED IN EACH CURRICULAR DIVISION, STUDENT HAVING THE FREEDOM TO ELECT, FROM AN APPROVED LIST OF COURSES, THE COURSES HE DESIRES. THE STUDENT CAN APPLY THESE COURSES TOWARD THE REQUIRED NUMBER OF CREDITS IN THE CURRICULAR DIVISIONS.
Agriculture, Technical		
Agricultural Education*		
Biological Sciences		
Communications		
Education Courses**		
Humanities		
Math. & Statistics		
Physical Education, Hygiene and Military		
Physical Science		
Social Sciences		
Other:		

Summary of Requirements For Graduation Or For Approval

	Credits
Required Courses (Column 1 Above)	
Required courses in curricular divisions that students may elect from an approved list of courses (Column 2 above)	
Free electives	
	Total Credits

* Exclusive of Courses taught outside the Department of Agricultural Education
**Courses taught outside the Department of Agricultural Education

2. Selection of Candidates

A. When do students ordinarily enter the curriculum in agricultural education?
___Freshman, ___Sophomore, ___Junior, ___Senior, ___As graduate.

B. Qualifications required of candidates entering the curriculum:

(1) Farm experience - years _____

(2) Grade point average _____

(3) High school vocational agriculture required yes____ no____

(4) Aptitude and achievement tests used: _____
_____
_____
_____

(5) Other

3. Analysis of Curricular Divisions In Which In Addition to Required Courses Specific Numbers Of Credits Are Required, And The Student Elects Courses To Meet These Requirements

Note: This section does not apply to specific required courses or free electives.

A total of _____credits are required to be elected in agriculture of which:
_____credits must be elected in the field of Animal Science including Dairy and Poultry,
_____credits must be elected in the field of Agricultural Economics,
credits must be elected in the field of Agricultural Engineering,
_____credits must be elected in the field of Crops, Horticulture, Forestry and Soils.

A total of _____credits are required to be elected in biological sciences, of which:
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____.

A total of _____credits are required to be elected in physical sciences, of which:
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____.

A total of _____credits are required to be elected in mathematics & statistics, of which:
_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____.

A total of _____credits are required to be elected in_____of which:

_____credits must be elected in the field of_____,
_____credits must be elected in the field of_____

4. Course Areas Comprising The Curriculum For Agricultural Education Majors

Directions: In the first column below, please fill the space provided with total number of credits in each course area required of all majors in agricultural education. The student has no choice in the matter.

In the second column, fill the space provided with the number of credits required in curricular divisions and in specific courses to meet these requirements.

In the third column, fill the space provided with the credits in courses elected by the majority of the agricultural education majors as free electives.

4. (continued)

COURSE AREAS	(1) REQUIRED OF ALL AGRICULTURAL EDUCATION MAJORS. THE STUDENT MUST TAKE THEM. (credits)	(2) COURSES ELECTED BY MAJORITY OF STUDENTS TO MEET REQUIRED CREDITS IN A CURRICULAR DIVISION (credits)	(3) COURSES ELECTED BY THE MAJORITY OF THE AGRICULTURAL EDUCATION MAJORS AS FREE ELECTIVES (credits)
Agriculture			
General-			
Survey of Agriculture			
Other:			
Agricultural Engineering-			
Agricultural Construction Materials and Procedures			
Carpentry			
Construction Methods & Materials			
Engineering Problems in Livestock Production			
Farm Buildings & Structures			
Farm Electricity			
Farm Machinery			
Farm Water Supply, Sanitation			
Farm Mechanics, Basic			
Irrigation			
Mechanical Drawing			
Metal Construction & Maintenance			
Methods of Teaching Agr. Mechanics			
Soil and Water Management			
Tractor Power			
Other:			
Agricultural Economics-			
Agricultural Cooperatives			
Agricultural Finance			
Agricultural Marketing			
Agricultural Policy			
Crop and Livestock Statistics			
Elements of Dairy Economics			
Farm Accounting & Business Analysis			
Farm Management & Organization			
Introduction to Agricultural Economics			
Marketing Livestock and Meat			
Rural Sociology			
Other:			
Animal Science-			
General			
Animal Nutrition			
Advanced Animal Nutrition			
Anatomy & Physiology of Animals			
Animal Sanitation, Disease Control			

4. (continued)

COURSE AREAS	(1) REQUIRED OF ALL AGRICULTURAL EDUCATION MAJORS. THE STUDENT MUST TAKE THEM (credits)	(2) COURSES ELECTED BY MAJORITY OF STUDENTS TO MEET REQUIRED CREDITS IN A CURRICULAR DIVISION (credits)	(3) COURSES ELECTED BY THE MAJORITY OF THE AGRICULTURAL EDUCATION MAJORS AS FREE ELECTIVES (credits)
Agriculture (continued)			
Animal Science (continued)			
Breeds of Livestock			
Livestock Production			
Livestock Feeding			
Livestock Feeding and Management			
Livestock Selection & Juding			
Livestock Marketing			
Principles of Breeding			
Veterinary Science			
Other:			
Dairy Science-			
Dairy Cattle Breeds			
Dairy Farm Problems			
Dairy Cattle Judging			
Dairy Sanitation			
Elements of Dairying			
Feeding Dairy Cattle			
Milk Production			
Other:			
Livestock Enterprises-			
Beef Cattle Production & Marketing			
Broiler Production			
Egg Production			
Horses and/or mules			
Poultry Production and Management			
Sheep and/or Goat Production and Marketing			
Swine Production and Marketing			
Turkey Production			
Other:			
Plant and Soil Science			
Crops-			
Crop Insects and Diseases			
Crop Production			
Forage Crops			
Principles of Crop Breeding			
Seed Analysis			
Small Grain Production			
Sugar and Fiber Crops			
Tobacco Production			
Other:			

4. (continued)

COURSE AREAS	(1) REQUIRED OF ALL AGRICULTURAL EDUCATION MAJORS. THE STUDENT MUST TAKE THEM. (credits)	(2) COURSES ELECTED BY MAJORITY OF STUDENTS TO MEET REQUIRED CREDITS IN A CURRICULAR DIVISION (credits)	(3) COURSES ELECTED BY THE MAJORITY OF THE AGRICULTURAL EDUCATION MAJORS AS FREE ELECTIVES (credits)
Forestry			
Farm Forestry			
Forest Protection			
Forest Products			
Forest Pathology			
General Forestry			
Timber Preservation			
Other:			
Horticulture-			
Floriculture			
Fruit Growing, General			
Grapes and Small Fruits			
Horticulture, General			
Landscaping			
Orcharding			
Plant Propagation			
Vegetable Crops			
Vegetable Crops, Advanced			
Other:			
Soils-			
Fertilizers			
Soils, Basic			
Soil, Conservation and Erosion Control			
Soil Fertility			
Soil Survey			
Other:			
Agricultural Education			
Developing and Supervising Farming Programs			
Directed Student Teaching			
Future Farmers of America			
Introduction to Vocational Agriculture			
Methods of Teaching Adults			
Methods of Teaching Young Farmers			
Methods of Teaching Young and Adult Farmers			
Methods of Teaching Vocational Agriculture in High School			
Observation & Survey of Programs in Agriculture			
Planning & Evaluating the Programs in Vocational Agriculture			
Other:			

4. (continued)

COURSE AREAS	(1) REQUIRED OF ALL AGRICULTURAL EDUCATION MAJORS. THE STUDENT MUST TAKE THEM. (credits)	(2) COURSES ELECTED BY MAJORITY OF STUDENTS TO MEET REQUIRED CREDITS IN A CURRICULAR DIVISION (credits)	(3) COURSES ELECTED BY THE MAJORITY OF THE AGRICULTURAL EDUCATION MAJORS AS FREE ELECTIVES (credits)
Biological Sciences			
Bacteriology			
Biology			
Botany			
Entomology, General			
Entomology, Economic			
Genetics			
Physiology			
Zoology			
Other:			
Communications			
English Composition			
Journalism			
Literature			
Speech			
Using Radio, TV			
Other:			
Education			
Audio-Visual Methods in Education			
Child Psychology			
Developmental Psychology			
Educational Psychology			
History of American Education			
Methods of Teaching			
Principles & Practices of Guidance			
Principles of Secondary Education			
Other:			
Humanities			
Art			
Foreign Language			
History			
Music			
Library			
Philosophy			
Other:			
Mathematics and Statistics			
Calculus			
College Algebra			
Statistics			
Trigonometry			
Other:			

4. (continued)

COURSE AREAS	(1) REQUIRED OF ALL AGRICULTURAL EDUCATION MAJORS. THE STUDENT MUST TAKE THEM. (credits)	(2) COURSES ELECTED BY MAJORITY OF STUDENTS TO MEET REQUIRED CREDITS IN A CURRICULAR DIVISION (credits)	(3) COURSES ELECTED BY THE MAJORITY OF THE AGRICULTURAL EDUCATION MAJORS AS FREE ELECTIVES (credits)
Physical Education and Military Hygiene			
Military Science			
Physical Education			
Other:			
Physical Sciences			
Astronomy			
Chemistry			
Geology			
Physics			
Other:			
Social Sciences			
Economics, General			
Geography			
Government			
Political Science			
Psychology, General			
Sociology, General			
Other:			

5. Selected Features Of The Curricula For Agricultural Education

1. What major improvements have been made in your agricultural education curricula during the past two years? Please give nature and extent of these improvements.

(Use back of page, if needed)

5 (Continued)

2. Assuming that the agricultural education staff could develop a curriculum for preparing teachers of vocational agriculture and that there were no limitations, such as funds, personnel or administrative regulations, what significant changes in the present curriculum would be made? Explain the nature of such changes which you feel will be put into effect in the immediate future.

(Use back of page, if needed)

6. Summer Experience

Summer experience, working with a teacher of vocational agriculture:
Required _____number of weeks _____number of credits granted _____
Elected _____number of weeks _____number of credits granted _____
Summer experience, working with an agricultural extension director:
Required _____number of weeks _____number of credits granted _____
Elected _____number of weeks _____number of credits granted _____

7. Student Teaching Participation Experience

A. Total number of weeks devoted to student teaching for gaining practical experiences:
1. Under the supervision of an experienced teacher of vocational agriculture
_____number of weeks _____number of credits granted
2. Under the supervision of an agricultural extension director
_____number of weeks _____number of credits granted
B. Number (average) of hours per day spent while student teaching:
1. _____in the high school, 2. _____with the agricultural extension director
C. Total number of class sessions taught by the average student during student teaching period:
1. High school classes_____, 2. Young farmer classes_____,
3. Adult farmer classes_____
D. The typical student majoring in agricultural education, while student teaching, supervises the farming programs of:
_____high school boys for_____weeks, _____young farmers for_____weeks,
and_____adult farmers for_____weeks.

8. Pre-Service Curricular Standards For Agricultural Education Majors

Note: Please read explanations on page 1 before answering this section.

Please answer the following according to what you feel should be considered as the ideal pre-service curriculum for agricultural education majors.

Answers are expressed in_____quarter credits,_____semester credits, (Check one.)

A. _____credits should be required for graduation, of which
   1._____credits should be in general education
   2._____credits should be in technical agriculture
   3._____credits should be in professional education
   4._____credits should be in_____

B. Of the_____credits in general education, (1, under A)
   1._____credits should be in social sciences
   2._____credits should be in humanities
   3._____credits should be in communications
   4._____credits should be in biological sciences
   5._____credits should be in mathematics and statistics
   6._____credits should be in physical sciences
   7._____credits should be in physical educatuion, hygiene, and military
   8._____credits should be in_____

C. Of the_____credits in technical agriculture, (2, under A)
   1._____credits should be in animal science, including dairy and pultry,
   2._____credits should be in plant and soil sciences, including soils, crops, horticulture and forestry
   3._____credits should be in agricultural mechanics and engineering,
   4._____credits should be in agricultural economics and rural sociology, including farm management, marketing, and finance
   5._____credits should be in_____

D. Of the_____credits in professional education, (3, under A)
   1._____credits should be in agricultural education, exclusive of student teaching
   2._____credits should be in student teaching in agricultural education
   3._____credits should be in professional courses taught outside the Department of Agricultural Education
   4._____credits should be in_____

E. Of the_____credits in plant and soil science, (2,under C)
   1._____credits should be in crop science
   2._____credits should be in soil science
   3._____credits should be in horticulture
   4._____credits should be in forestry
   5._____credits should be in_____

F. Please list other suggestions concerning standards for undergraduate curricula in agricultural education.

(Use back of page, if needed)